PEOPLE AND DAMS

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Contents

Preface 1

Dammed or Damned? 9
PHILIP HIRSCH

Environmental Cost of Forests:
Need for scientific criteria 17
MOHAN HIRABAI HIRALAL

Resettlement of Large Dam Oustees in India 20
MANAB CHAKRABORTY

Appraisal of Resettlement and Rehabilitation 34
KASHYAP MANKODI

Hirakud Dam Project: Expectations and realities 47
S K PATTANAIK, B DAS, A MISHRA

Tehri Dam 60
SUNIL K ROY

Narmada Issue: An overview 77
KAVALJIT SINGH

The Impact of Subarnarekha Multipurpose
Project on the Indigenous People of Singhbhum 83
MATHEW AREEPARAMPIL

One More Peril — A Report on Polavaram Project 106
DR P VENKAT RAO AND A TEAM OF SENSITIVE INVESTIGATORS

Social Implications of Nam Choan Dam, Thailand 119
PHILIP HIRSCH

Nam Choan Dam: The agony of the land 125
VIRAWAT THEERAPRASAT

The Pantabangan Experience 136
PROF. GRACE DE LA COSTA-YMZON

Batang Ai Dam: Socio-economic impact of resettlement 143
SOCIETY OF CHRISTIAN SERVICE, SIBU, SARAWAK

Bakun Dam: Educational and organizing efforts 149
SOCIETY OF CHRISTIAN SERVICE, SIBU, SARAWAK

Magat Dam: Failure of people's mobilization 153
SABINO G PADILLA, JR

Chico River Dam and Beyond: People's struggle for
self-determination 158
GERALDINE F FIAGOY

List of Participants: Workshop on People and Dams 166

Preface

In recent years, controversies over the construction of large dams have acquired the dimension of a national debate in several third world countries. These debates have thrown up a plethora of questions which ranges from challenging the very basis of such projects, their socio-political and ecological consequences, to the issue of social justice for the people affected in the process. Such debates are usually the culmination of a process triggered by the response of concerned intelligentsia and field-based groups working on environmental issues and with the people affected by the onslaught of so-called "development".

The Society for Participatory Research in Asia (PRIA), which provides support to field-based groups for research, training and education, became involved in understanding the problems of forest dwellers vis-a-vis government policies, as a response to the felt and expressed needs of the groups in 1982, when PRIA was formally founded. This experience led PRIA to evolve a broader programme on issues related to Land Ownership and Alienation, which helped to relate to rural-based social action groups in different parts of India. The basic shape of this programme was evolved in a national workshop on this theme organized in February 1984. Consequently, PRIA has organized regional consultations in Uttar Pradesh, Orissa, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra and Rajasthan. These consultations brought out several issues related to the problems of land alienation. However, the issues of the capitalist mode of agriculture and displacement of people due to major projects were common to all areas, and were identified as the major causes for land alienation in modern times. Interestingly enough, both these causes are complementary to each other and raise basic questions on the perspective of the concept of development itself.

As part of a response to this process, PRIA organized a national convention with the help of the Xavier Institute of Social Sciences, Ranchi, Indian Social Institute, New Delhi and Centre for Science and Environment, Delhi, on "Major Dams in India: A Case of Koel Karo" during February 1985. This was followed by the publication of a popular document in Hindi and organizing training of activists to assess the impact of big dams.

In continuation of its activity in this field, PRIA organized a workshop on "People and Dams" for Asian and South-Pacific countries during September 1987 (in collaboration with ASPBAE) in order to facilitate the exchange of experiences and ideas among groups in the region. The workshop was attended by 30 activists and academics concerned with the past, current, and imminent dislocation of local populations due to large dam projects, in Asia. The objectives of this workshop were to understand: the problems created by large dams for human populations, the forces affecting displaced populations, the rehabilitation of these populations, and to gain a systematic perspective on popular education to build public opinion against big dams.

The participants represented five Asian countries: India, Malaysia, the Philippines, Sri Lanka and Thailand. The focus was thus very much on the impact of large scale infrastructural projects in the developing countries, and the connection between dam construction and national development strategies.

The workshop focused on the first-hand experience of field-based activists working among people affected by large dams. At the same time, emphasis was placed on issues such as the cost-benefit analysis of large dams, keeping in mind the importance of political consideration which in the final analysis, play a major role in the decision to construct dams.

The discussions during the workshop outlined the following issues as part of a systematic perspective to look into problems related to "people and dams".

Conflict of interests

Having had experience of campaigns and involvement in building public opinion, most of the participants felt that dam projects represent a conflict of interests between the powerless local populations and the powerful sections of society. The interests of powerful sections were generally projected as the interests of society at large, and this provided the basis for the justification of such projects.

Centralized control of natural resources

The existing international economic order and its unequal terms of trade have led to a tilt in the balance of payments in favour of industrialized or developed countries. This is a trap in which most developing countries are caught today. In order to overcome this imbalance, developing countries have to take measures to create conducive conditions for the import of capital in the farm or industrial sectors. To attract foreign investments these countries must resort to the following:

(i) popularization of water and capital intensive agriculture;

(ii) building-up reliable infrastructure (uninterrupted supply of water and power and efficient communication systems) through national and international borrowings;

(iii) earning foreign exchange through the export of raw materials (since they cannot compete with developed countries in the finished goods market).

All these measures require centralized control over natural resources. Dams are an example of such centralized control over a vital natural resource, namely, water.

Chasing a mirage

The technological advances of the twentieth century in the fields of aviation and communication have certainly led to internationalization of socio-cultural and political life, which in turn, has helped enhance markets and control over markets without militarily enclosing the territories of these countries. This has been complemented by the quest for westernization displayed by the "alter egos of the colonial masters" namely the local ruling elite of developing countries.

With such a background, most of the developing countries have entered the world economic order as independent entities, at a stage when that order is already crisis-ridden and its contradictions are explicitly manifested through market competition and recession.

In this context, the classical theories of demand and supply have been rendered useless and the creation of artificial demand through aggressive campaigns under monopoly conditions, has become the keyword for survival in the world economic order.

It is this mirage of artificial demands created through the historical process that most developing societies are chasing today, and which render acceptable everything that is done in

the name of development and modernization including the destruction of ecology and its own populace.

The strategy of resistance to the onslaught of an uncertainable development and attempts to work for an alternative sustainable development should take into account these perspective-related issues. Organizing campaigns around issues of displacement and resettlement, formulating the parameters of cost-benefit analysis, finding a new approach to water management, and such other alternatives with wide perspectives, were absent from strategies adopted earlier. But the concerns in this direction expressed by the participants at the Delhi meeting would certainly be a step forward in mitigating the sufferings of the displaced people.

This volume is primarily a compilation of case studies, with a few additions, presented at the regional workshop on "People and Dams", held by the Society for Participatory Research in Asia (PRIA) from 14th-18th September, 1987 in New Delhi. The material is divided into **three sections**: General, The Indian Cases, Cases from Other Asian Countries.

In the **first section,** the paper "Dammed or Damned" by Philip Hirsch of the University of Sydney, Australia, gives a summary of the major issues raised at the workshop. The paper also addresses the larger questions of dam construction in the world.

While approving a dam project, the environmental costs of forests are usually undervalued and ignored, possibly due to the dominance of biased techno-economic considerations. This issue has been widely discussed in the paper, "Environmental Cost of Forests: Need for Scientific Criteria", by Mohan Hirabai Hiralal, an activist of the 'Jangal Bachao, Manav Bachao' ('Save Forests, Save Mankind') Movement, Maharashtra.

Manab Chakraborty of Oxfam (India), Lucknow in his paper, "Resettlement of Large Dam Oustees in India" gives an account of the displacement and resettlement of the people displaced due to large dams in the country. In this paper, the author has suggested various remedial measures and alternative modules for better resettlement and rehabilitation of the oustees. The author also calls for a comprehensive rehabilitation policy for the displaced people at the national level.

The paper, "Appraisal of Resettlement and Rehabilitation" by Kashyap Mankodi, an activist from Gujarat, was presented at a training workshop on dams organized by PRIA in Rajasthan in 1985. This paper will be helpful to the activists as it provides a checklist of questions which should be raised with respect to every programme of rehabilitation in order to gauge its viability.

The papers incorporated in the **second section** deals with the five major dams in India viz. Tehri, Polavaram, Narmada, Subamarekha and Hirakud.

Except Hirakud, all the dams are under construction and are being questioned on various grounds by the social activists and environmentalists.

The first paper, "Tehri Dam: A Case Study" is by Sunil K Roy, who was the Chairman of the Working Group for the Assessment of the Environmental Impact of Tehri Dam, appointed by the Government of India, to look into the cost-benefit analysis of the Tehri Dam. Although the author was not present, his paper was presented at the workshop. The paper provides an insight into the dominance of techno-economic considerations and the total ignorance of human and environmental considerations in the approval of this project. In the paper, he calls for the approval of only those dam projects which apart from techno-environmental considerations incorporate comprehensive socio-economic aspects to establish the viability of the projects.

This is followed by Kavaljit Singh's paper titled, "The Narmada Issue: An Overview". The paper outlines all the major controversial issues raised by social activists and environmental-

ists against the Sardar Sarovar and Narmada Sagar Dams, the two major constituents of the massive Narmada Valley Development Project.

The paper by Mathew Areeparampil, Director, Tribal Research and Training Centre Chaibasa (Bihar), on the impact of the proposed Subarnarekha dam on the indigenous people of Singhbhum, Bihar is an eye-opener. In this paper, Mathew critically assesses the social, cultural and economic costs of the dam to be paid by the tribals in the wake of displacement. According to the author, the Subarnarekha dam will certainly lead to the pauperization and enslavement of the majority of the displaced tribals.

The proposed Polavaram Dam project across the river Godavari at Polavaram, Andhra Pradesh, will displace nearly two lakh people from their ancestral lands. The paper "One More Peril: A Report on Polavaram Project" by P Venkat Rao of the Centre for Environment Concerns, Secunderabad, discusses the social, economic and environmental implications of the Polavaram dam. The paper is mainly based on the survey carried out in the submerging areas to assess the socio-economic conditions of the people and seek their opinions on dam construction and rehabilitation.

Hirakud dam in the state of Orissa is very much in news nowadays. Not only has the life of the dam been reduced from the expected 110 years to 35 years but nearly one lakh people displaced from this dam are still unrehabilitated. The paper, "Hirakud Dam Project: Expectations and Realities," jointly written by SK Patnaik, B Das and A Mishra, activists from Orissa, throws light on the fate of the oustees who have been displaced for thirty years.

In the **third section,** there are two papers on the Nam Choan Dam, Thailand, namely, "Social Implications of Nam Choan Dam" by Philip Hirsch and "Nam Choan Dam: The Agony of the Land" by Virawat Theeraprasat. Interestingly, this dam project was shelved in April 1988 due to strong public opinion and protests. We think that it will be worthwhile to incorporate these papers as they mainly deal with the role played by mass media and popular educational efforts in creating wider awareness on the ill-effects of this dam. These papers will be of immense use to the field-based groups and activists who are carrying out similar struggles against dam projects in other parts of the world.

Grace de la Costa-Ymzon of the University of Philippines, highlights the social, economic and ecological problems arising out of large dams in Philippines with special reference to the Pantabangan Dam. Her paper, "The Pantabangam Experience: A Case Study" also discusses the role and importance of community organization and popular educational efforts undertaken by many action groups and activists among the displaced people.

This is followed by two papers on the Batang and Bakun dams in the Sarawak region of Malaysia. The first paper on the proposed Bakun Dam project by Tay Hock Joo, an activist of the Society of Christian Service, Sarawak, Malaysia, focuses on how the educational and organizational efforts among the Bakun people through discussions, workshops, exposure programmes and signature campaigns for five years (1982-87) has increased awareness of the impact of the Bakun Dam.

The second paper, "Batang-Ai Dam: Socio-economic Impact of Resettlement", by Jeanne Hon, another activist of the Society for Christian Service, gives an account of various problems faced by the displaced people due to the construction of the Batang-Ai Dam. According to the author, resettlement as a consequence of this dam has made the once-lively and self-sufficient people destitutes.

Geraldine F Fiagoy, a community organizer in the Cordillera region of northern Philippines, in the paper, "The Chico River Dam and Beyond: The Cordillera People's Struggle for Self-Determination", discusses the successful resistance by the would-be displaced people against the attempted construction of the Chico Dam. This resistance ultimately led to the cancellation of this dam project.

On the other hand, Sabino G Padilla of the University of Philippines in her paper on the Magat Dam, looks at the failure of people's mobilization to stop the construction of this dam. No people-oriented groups had attempted to organize the diplaced population due to the ignorance of the negative impacts of this dam, says the author.

We hope that this collection of papers and case studies would not only advance the analysis and debate on the socio-economic and environmental viability and desirability of large dams in the developing countries, but also illustrate the use of educational intervention in raising the awareness of people about these issues and democratizing the debate about large dams away from the narrow confines of experts and environmentalists to the broader arena of the general public and the toiling masses.

OVERVIEW

Dammed or Damned?

PHILIP HIRSCH

The following is a summary of issues raised at a four-day workshop on "People and Dams" organized by the Delhi-based Society for Participatory Research in Asia (PRIA) in September 1987. The object of the meeting was threefold: to understand the problems created by large dams for human populations; to consider the forces affecting the displaced populations and 'rehabilitation' efforts; and to gain a systematic perspective on popular education efforts among the people affected by dams.

The terms of reference for the workshop participants were thus clearly set as identifying, clarifying, and dealing with the negative effects of large dam construction. The workshop participants represented five Asian countries: India, Malaysia, the Philippines, Sri Lanka and Thailand. The focus was thus very much on the impact of large scale infrastructural projects in a "Third World" setting, and the connection between dam construction and national development strategy was a key issue throughout.

Despite the participation by a number of academics and ex-academics, the primary input to the workshop was that of activists with first-hand experience of working with populations affected by large dam construction. Recognition of the political nature of the decision to build large dams calls for equally political responses. The place for, and techniques involved in cost-benefit analysis were considered as part of the workshop's proceedings, but the political context of the final decision to build a dam were considered to be of ultimate significance.

Dams and people

The social and environmental impact of large dams has been documented comprehensively in the three-volume publication by Goldsmith and Hildyard.* The aim of the PRIA workshop was to go beyond a further cataloguing of tales of woe, in order to understand why, with such an inventory of reasons not to build large dams, there was still such a long list of dams due for construction in the near future. Of more practical value was the sharing of experiences of those actively opposed to particular dam projects and an attempt to systematize opposition at a number of levels.

The first point to note is the lure of large dam projects as a solution to energy and agricultural needs of developing countries. The ability of hydro-electric turbines to be switched on and off to serve peak load demands and the enormous volume of water stored behind large dams has given them an image as saviours of fossil fuel resource in poor and arid countries of South and South-East Asia and elsewhere. The fascination of large dams has been further accentuated by their very scale, as monuments to progress and, in the case of India, as symbols of independence and national self-sufficiency.

* Edward Goldsmith and Nicholas Hildyard (1984), The Social and Environmental Effects of Large Dams, Wadebridge Ecological Centre.

The nationalist rhetoric behind dam construction masks the far from equal distribution of social benefits by large dams. The multi-purpose nature of dams as hydro-electric and irrigation projects is largely illusory, since these two functions are competitive rather than complementary. The timing of the release of irrigation water is as important as its volume, and the demands of electricity consumers are not the same as those of the farmers. Since large dams are generally controlled by electricity generation authorities rather than by the irrigation departments, it is the needs of the largely urban, industrial energy consumers, rather than those of rural agriculturists, that take precedence.

In the context of India, equity questions are raised over the emphasis on large scale irrigation projects. First is the tendency to displace tribal populations in order to provide water benefits to lowland farmers who are already relatively better off. Second are the regional biases that arise out of a water-intensive agricultural development strategy. For example, Anil Agarwal, one of India's leading environmentalists, questions the concentration of resources in areas like the Punjab, creating regional inequalities and an ultimately unsustainable system of agriculture, rather than developing less dramatically the vast areas of grassland that are currently being degraded.

Equity questions also lie behind the justification of dams by their contribution to the electricity generating capacity. Apart from the issue of alternatives, to be dealt with below, is the question of who is to consume this extra energy. Increasingly, links are being drawn between growth in energy demand, national industrialization strategy, and relocation of First World industry to Third World sites. Export processing zones are often prime consumers of electricity, and the involvement of the World Bank in funding many of the large projects under discussion cannot be divorced from this broader "developmental" strategy. None of this is novel revelation or even controversial in terms of the modernization as seen by international development technocrats. What needs to be brought to the fore, however, is the element of trade-off involved, so that both sides of the modernization equation are fully accounted for, and so that no single development path is seen as an inevitable consequence of "progress". To date, the greatest victory of dam builders has been to set the terms of debate as how best to achieve damage limitation or amelioration rather than whether or not a particular project or strategy is desirable in the first place.

The question of who benefits from dams is thus a key issue, one that reflects the distributional questions that need to be raised about all aspects of development. Another, which is particularly important in the context of dam construction, is the impact of large scale displacement on local culture. It is increasingly recognized that cultural and biological diversity are closely inter-related, so that the destruction of local environments and with them sometimes unique ecosystems (such as would be the case with construction of the Nam Choan Dam in Thailand) can also lead to a form of cultural genocide. The experience of the Iban people displaced by the Batang-Ai Dam in Sarawak shows the way in which displacement can so alter a people's lifestyle as to be destructive of their entire cultural system.

In this context, it is sometimes difficult to draw a clearcut line between social and environmental effects of large dams. Shifting cultivators in particular, but also other agriculturists, are dependent for their livelihood and associated way of life on their immediate environment, which means that a large scale project that disrupts that environment also threatens the wider social system of those affected.

Displacement and resettlement

The most immediate human impact of a large dam is its effect on people living/working on land in the area to be flooded by the dam reservoir. Displacement of people is an unavoidable consequence of dam construction in all but uninhabited areas, of which there are few.

Moreover, the nature of dams is to flood lowland, riverine environments, which are often the most favourable areas for settlement and cultivation. As more and more of the sites with least impact on local people have been used up by existing dams, new sites involve greater amounts of displacement, sometimes involving people who have previously been resettled as a result of dam construction elsewhere.

Dams are being constructed in more and more peripheral areas, which are considered suited to damming by virtue of their topography. Another feature of these areas is the marginality of their populations, ethnically, economically and politically. Highland areas tend to be occupied by tribal shifting cultivators without legal tenure of the land that they work. Whether in the case of the scheduled tribal people of India (eg. Subarnarekha in Bihar), the Karen of Western Thailand (Nam Choan Dam), the Penan and Kenyah of Sarawak (Bakun Dam) or the Ifuago of North Luzon (Chico Dams), rights to land are not recognized under national law. Indeed shifting cultivators are often considered to be working land illegally, despite the fact that their occupation of such land may predate its declaration as forest reserve.

The scale of displacement varies considerably with the size of the dam, the nature of the topography in the dam watershed, the availability or otherwise of land in the immediate vicinity of the reservoir, and the density of population in the area. Nowhere in South-East Asia is the scale of displacement as large as it is in India. Whereas the Nam Choan and Batang-Ai schemes of Thailand and Malaysia involve displacements of the order of thousands; most Indian cases involve hundreds of thousands (lakhs), and in the case of the Narmada scheme more than one million people. The scale of displacement affects not only the quantitative impact of dam construction, but also qualitative impact. Under large scale displacement it is virtually impossible to organize resettlement sites for all those affected, and compensation is in cash (to be discussed further below). Even where resettlement is catered for, there is a qualitative difference between resettlement in the immediate area of the dam and displacement over longer distances, often onto marginal land of poor quality for agriculture and in an environment unfamiliar to those being resettled. The advantage of small schemes is that those displaced also have a greater chance of being beneficiaries of the dam, since they may be able to take advantage of irrigation water on lands below the dam. On the other hand, the advantages promised to local people (such as free or low-cost electricity) have often failed to materialize.

As a result of the official status of marginal populations as "non-people" or at best politically irrelevant and whose resettlement is thus seen as a positive rather than negative outcome of the dam, dam construction has been relatively unhindered by displacement. In some cases the local people have simply been ignored and left to fend for themselves. More often, however, some form of compensation has been given, however token it may be. There is an important difference between compensation given in cash and that given in land. Due to declining areas of vacant land suited to agriculture, problems of administration of resettlement schemes, and the very scale of displacement under some projects, dam construction authorities have found it simpler to give compensation in cash. The amounts given are by definition arbitrary, since many of the assets of those flooded, including their land, do not have a market value. Rarely are productive assets such as fruit trees fully or properly valued, and the price paid for land is not adequate for the purchase of equivalent amounts of similar quality land elsewhere, not to mention other costs of displacement. The amounts involved may often seem considerable for farmers who hitherto have been used to dealing with only small amounts of cash, and this may have the double effect of not only easing undercompensation for productive assets, but also lead to a rapid frittering away of what compensation is given. A point that is rarely touched on is the fact that while subsistence land is often worked, owned, and inherited by women, compensation is given to men. Problems of alcoholism, followed by degradation and destitution have resulted from resettlement, as in the case of the Iban of Sarawak in the wake of the Batang-Ai dam construction.

When land is given in compensation, at least four types of problems are prevalent. First is the lack of preparation of resettlement sites, so that settlers have to spend time and money re-establishing themselves and often get into debt in the process. Second is the inferior quality of new land, which may be some distance from a source of water supply, of poorer soil and greater slope than the land vacated, and be surrounded by a less hospitable environment for supplementary subsistence activity (especially forest for herbal and food needs). A third problem is the expectation on the part of the resettlement authority that shifting cultivators should take up settled agriculture, often on land unsuited to permanent cultivation without considerable investment. Last is the problem of allocation of land already under de facto occupation, leading to conflict between new and old settlers.

The net result of failure to compensate for loss, not only of land but also of livelihood in a much wider sense, is a low success rate of rehabilitation. However, the problems may take some time to show themselves. The problems involve dispersal of the community, and raise other problems of debt and alcoholism that are attributed to individual weaknesses rather than direct consequences of displacement. Thus the silent nature of the suffering caused results in few lessons being learned vis-a-vis dam construction.

Cost-benefit perspectives

One reason why so many destructive projects have gone ahead is the means by which they are assessed in advance. Dam projects are a case in point of conflict of interest between local populations and the wider society, and as a result some objective means of assessing the relative merits and demerits is sought. The principal means for carrying out this exercise is cost-benefit analysis. In the past, this has failed to prevent construction of schemes for a number of reasons.

First is the difficulty of costing certain variables and the corresponding ease with which they are dismissed or simply ignored. Many of these are key impacts of the dam project. Undervaluation of subsistence assets has already been discussed. Also significant are wildlife and flora, many of whose species await discovery, archaeological evidence, and cultural diversity. Many of these assets would be considered as priceless; yet because no price can be attached they are simply discounted. The priceless has no price; the invaluable cannot be valued. Such crass calculation, although less common now than in the past with increasingly sophisticated economic techniques of analysis, nevertheless has been applied in the case of Nam Choan Dam in Thailand, which threatens irreparable damage to the finest remaining area of tropical forest in mainland Southeast Asia.

Apart from understatement of costs that results from failure to take into account what cannot easily be quantified, a second drawback in cost-benefit analysis as it has been applied is the exaggeration of benefits. As a result of siltation of reservoirs associated with upstream deforestation, the lifespan of most dams has proven to be considerably shorter than that used for purposes of calculating long-term returns to investment. Annual hydro-electric production has been well below that of most figures used in calculation, mainly as a result of discrepancies between potential and actual average generation. Double counting has resulted from false assumptions concerning the multi-purpose nature of the dam, so that a trade-off has had to be made between hydro-electric production and irrigation. Additional benefits such as tourism and fisheries have proven to be highly spurious, and rarely are the destructive impacts of dam construction on recreation and natural freshwater fisheries taken into account.

One answer to these problems has been to increase the sophistication of cost-benefit analysis techniques. Increased understanding of the wide-ranging implications of large dams

has led to a larger number of variables being taken into account. Environmental impact assessment is used as a matter of course in environmentally sensitive projects. Social costs of dams have been translated into cash amounts so that the full costs of dams can be assessed more realistically. On the benefit side, the experience of existing dams can be taken into account to tone down the claims of engineers and predict benefits with more accuracy. In principle, then, while even a more sophisticated cost-benefit analysis can never fully or accurately cover the merits and demerits of a dam project, it can be used to show the false basis on which previous dams were built and the uneconomic nature of proposed dams if all factors are taken into account.

Nevertheless, a number of problems remains. One is access to information, which remains largely in the hands of the proponents of dams; this is to be discussed more fully below. A second problem is agreement on what factors are to be taken into account and what valuation is to be given. Cost-benefit analysis is a supposedly objective method, but usually it is carried out at the behest and with the resources of the dam proponents. Given the considerable leeway that still exists for interpretation and valuation of costs and benefits, objectivity is open to question.

For opponents of large dam projects, there is a real dilemma concerning use of cost-benefit analysis. On the one hand, full accounting would show many schemes to be uneconomic and cost-benefit analysis could thus be used to advantage, meeting the project on its own terms and debating the project in its own language. On the other hand, acceptance of cost-benefit analysis affords legitimatization to an evaluation technique that will always be imperfect and, more importantly, open to manipulation. As a short term tactic in pointing out the obviously misguided project, sophisticated cost-benefit analysis may be a useful tool; as a long term strategy it risks subordinating human values and interests to those of the market, and one distorted by vested political interests to boot.

A final aspect of cost-benefit analysis that needs to be examined closely is its relationship with compensation mechanisms. Many of the costs of a dam are, from the point of view of the project funder, quite abstract since there are no existing means of compensation. Once the project is approved such costs as loss of species are borne by society as a whole and do not fall on the project holder. As a result, there is every incentive to discount these costs. Any acceptance of cost-benefit analysis by opponents of large dams must go hand in hand with a fuller set of compensation mechanisms so that those who bear the costs are compensated and do not remain part of an abstract equation to be buried in a pile of papers once the project goes ahead.

Watershed perspectives

Dams are often put forward as creative of water resources. But are large dams "creators" of water? From the perspective of watershed management rather than the immediate area of a dam reservoir, dams can actually serve to decrease the water available for use in a number of ways. First, the evaporation rates of large reservoirs can be as high as 40 per cent of the water entering the reservoir. Some of this later falls as rain, but the rest is lost to the watershed. Second, stagnation of water behind and below dams leads to pollution and effective loss of the usefulness of water. Third, inability to control or predict the timing of release of water makes it difficult for farmers below the dam to use the water that is made available for irrigation. In some senses, then, dams serve rather as destroyers of water.

Also from the perspective of the watershed, it is important to identify not only immediate upstream effects of dams and their reservoirs but also downstream impact. This is varied and often quite indirect, making it difficult to identify dams as the ultimate culprit. One set of effects results from the period during which the reservoir is being filled, which can typically take two to three years. Reduction in flow of water can lead to saline intrusion at the

estuary of the dammed river, as happened in the early 1980s at the mouth of the Maeklong River in Thailand following completion of the Srinakharin Dam. Salinization of soils can result from impounding of water in areas with saline substrata. Over a longer period, loss of fertility can result from blockage of silt that has traditionally been important for replenishment of flood plain soils; such has been the case in Central Thailand following the completion of the Chainat and Bhumiphol dams. Even less tangible is the threat of dam failure and flooding downstream that is created by large dams.

Inasmuch as large dam projects do concern themselves with broader problems of watershed management, they do so by starting at the bottom of the watershed rather than where the rain falls, i.e. at the top. Traditional systems of water management, notably that of tank systems in Sri Lanka and southern India, take an opposite approach, focusing on small scale works that are integrated from the top of the watershed downward. A primary consideration is forest preservation as the most efficient means of regulating annual flow of water rather than the ameliorative measures that are taken when large scale projects inadvertently lead to deforestation and associated problems of reduced storage, increased runoff, erosion, and siltation.

The issue of scale also impinges on the politics of water management: who are the managers under different systems? Under small scale, traditional systems, water is managed locally. "Hydraulic society", or large scale centralized water management and despotic political organization was the exception rather than the rule in South and Southeast Asian society. It was only during the colonial era and in the large-scale national development projects since independence that water management has become more and more centralized, with a consequent lack of awareness of local ecology, agronomy, and social aspects of maintenance of watersheds.

There is no doubt that one reason for large scale schemes is a genuine and general belief in economies of scale. From the point of view of centralized management, moreover, there may be some superficial truth in such economies, since the establishment of an administrative system to deal with a large number of small scale projects would be a costly—and most likely ineffective — extension of the bureaucracy. However, the principal element in large scale projects is the kudos they confer on those at senior levels responsible for these giant structures. The symbolic power of large dams cannot be overestimated, and this can apply equally to national policy makers and international loan agencies. Meanwhile, the momentum of hydro-electric administrations is another important factor. The size of these schemes is such that each one may employ a significant proportion of a hydro-authority's engineers, which means that once one scheme is completed there is a powerful vested interest in getting a new project off the ground.

Political perspectives

In order to fully appreciate the centralization of control that is a part of large dam projects, the focus of attention must go beyond the direct issue of water management. Apart from centralizing water management, large dams are important political instruments in a number of other ways. The accessibility of previously isolated areas afforded by roads made necessary for construction of the dam, and to a lesser extent by the reservoir, gives State authorities enhanced control over peripheral populations. Resettlement of scattered populations gives a high degree of control by the State resettlement authorities over every aspect of the lives of those affected. The agriculture served by new irrigation schemes follows the Green Revolution model, and as such relies on centralized technology, inputs, and knowledge systems.

The political context of dam construction is thus one of opposition of central and local, State and non-State interests. The political significance of dams necessitates political contexts of struggle against them. This is not to imply violence or confrontational resistance

as a sine qua non in opposition to large dams, but rather to suggest that before attempting an objective weighing of neutral pros and cons, it is important to recognize the breadth of vested interests involved in dam projects.

Once it is acknowledged that both dam construction and opposition to dams are essentially political issues, the importance of information becomes clear. A major obstacle faced by opponents of many large schemes is the difficulty of obtaining accurate and detailed data concerning the dam before it is too late and the project can be presented as a fait accompli, with funding negotiations and investment in surveys at such an advanced level that it is made politically difficult to turn back. There are two main reasons for this difficulty in obtaining information. The first is the lack of resources faced by dam opponents when compared with those of dam proponents; even if only one per cent of the cost of a dam is spent in carrying out initial survey work, this can be measured in hundreds of thousands or even millions of dollars. The second reason is the secretiveness of the dam authorities, who treat most information related to the project as State secrets, to be released only selectively as they enable the dam to be shown up in the best light possible. The effect of this inequality of information is to make opponents appear amateur in their objections, anti-developmental, and vulnerable to deluge by statistics, many of which may prove to be spurious as in the case of tactics used by the Electricity Generating Authority of Thailand (EGAT) in the case of Nam Choan Dam. Even more to the point, in the event of a large dam becoming a national issue, as in the case of Nam Choan, access to the media may be severely biased. In 1982, Thai civil servants, including forestry officials and academics, were forbidden to speak out against the dam, while EGAT had constant access to national (army operated) radio stations for its propaganda.

A common rejoinder by proponents of large dams is to challenge the opposition to come up with something better. This has been compared to an opera singer who, when heckled for dissonance, challenged the dissatisfied member of the audience to come and do a better job. The point here is that resources for research and development are centralized, and for political reasons outlined above, large dam projects receive precedence over alternative forms of energy or water management. Alternatives certainly need to be proposed if opposition to dams is not to be seen as "anti-developmental", but development of alternatives requires time and resources.

Learning from experience: organization and education

From the above discussion of the issues surrounding construction of large dams, a number of lessons is to be gained for organization and education of local people due to be affected by dam construction. Adjustment of organization to the scale of the issue is important. Local level organization is the most effective and fundamental in that it involves those directly affected by the dam. However, political sensitivity of the area to be affected may impede local mobilization, in particular if it is isolated from wider support. At a broader level, therefore, support among conservation groups, political figures, and the media can play an important role. At the international level, pressure on the World Bank, OECF, and other funding authorities is important and shows signs of achieving results with increasing sensitivity to criticism being shown by these bodies.

In particular, in the context of this workshop, the first to bring together those concerned with social impact of large dams in several Asian countries, the importance of links between groups should be stressed. This is not to overemphasize the value of a "talking shop", when dealing with fundamental issues must first and foremost involve local level action and preaching to other than the converted. Nevertheless, the realization that others are facing similar forces and carry similar struggles is of value in itself and can serve two important tactical purposes, over and above any renewal of courage that it lends to those

involved in isolated campaigns. First is the exchange of methods of organizing local people, educating the wider public, obtaining information, and other tactics found to have met with success. Second is the advantage of obtaining a fuller campaigning inventory of experiences of effects of dams on people. With a greater accumulation of evidence of the hollowness of claims put forward for existing dams, campaigns against new projects become more credible. There is the additional advantage of international links that detailed exposure of the failures of dam projects abroad may be politically more feasible than criticism of a project closer to home.

It is useful to distinguish between organization at the pre-, during-, and post-construction ("post-mortem"!) stages of a dam. In the case of the Chico River scheme, effective organization has led to the project being shelved; moreover, organization on this particular issue has served as a springboard for the Cordillera People's Alliance to serve as a campaigning body on numerous other local issues. In the case of the Tehri Dam on the Ganges, campaigning is carrying on despite the decision to go ahead with the dam. Work among the Iban relocated as a consequence of the Batang-Ai has involved organization of those suffering the consequences of dam construction. Organized visits to this relocation site by those threatened by the Bakun Dam helps to raise awareness among these people of what it is that they are threatened with.

Dams have symbolic importance to their architects and builders; likewise, symbolism is an important part of education and organization in opposition to dams. Whether it be a photograph of a drowning tiger, a dam in the shape of a fist grabbing at water, people, trees, or some other apposite symbol of the dire effects of dams, a single image can have more political clout than pages of argument or cost-benefit analysis.

In the educational side of campaigning, it is important to bear in mind who is learning from whom. People to be affected by dams may be the best educators, helping those who may have more access to the media, national level decision makers, and others to put the message across. On the other hand, relatively isolated groups with no experience of the effects of large dams may need to be made aware of the situation they are to face and the need for local action if the dam is to be halted.

It has been said that the age of large dams is drawing to a close. Yet the number and scale of dams that are on the cards is indicative of the destruction that remains to be wrought on vulnerable people and fragile environments if these projects are allowed to go ahead. As a matter of logic, increasing scarcity of suitable sites for dam construction means that each new site tends to be in a more vulnerable area than the last. There is no room for complacency.

Environmental Cost of Forests: Need for scientific criteria

MOHAN HIRABAI HIRALAL

Forests produce oxygen necessary for the sustenance of life. They utilize solar energy, leading ultimately to the production of food, clothing, shelter, fuel, fodder, fertilizers etc., necessary for our survival. Forests hold rainwater. They not only check the erosion of the fertile soil whose formation takes thousands of years, but even enrich the soil. They obstruct and control the wind; they reduce the atmospheric temperature and keep it at a level optimum for the growth of life. Thus, the vital necessity of forests has been a matter of experience, from time immemorial, for man living with nature. Recent developments in science have vindicated this experience.

According to satellite data available now, India is losing 1.3 million hectares of forests a year, nearly eight times the annual rate put out by forest departments. (The State of India's Environment 1984-85. The Second Citizen's Report). The government agrees that although 23 per cent of the land in India has been classified as forest land, only 10-12 per cent is actually under green cover. It is generally accepted that ideally, at least 33 per cent of the land should be under forests. Therefore, destruction of forests in India is all the more significant in this context. There has been wanton destruction of the forests for agriculture, large dams and industrial projects. This process continues in the name of development. British imperialism indiscriminately exploited forest wealth. The British forest policy remained in force even after Independence with very little change. Acceptance of the model of economic planning brought many things in its trail. For dams and other projects, the cost-benefit ratio is invariably calculated. The value of the forests, however, used to be computed till 1985 from the woodstock available after felling the trees.

The Forest Conservation Act of 1980 was a milestone. It initiated action on the level of the central government. The then Prime Minister, Mrs Indira Gandhi, herself evinced keen interest in this area. A separate Ministry for Environment was created. The team, under secretary Shri Sheshan, became active. The general consciousness about environmental issues inside and outside the country and the pressure it exerted, was also considered. All this resulted in a step forward. The central government decreed in 1985 that the environmental cost of forests be taken into account while computing cost-benefit ratios. The criteria for such computation were also prescribed. The scientific truth, that forests do not just mean

timber, was accepted in economic planning for the first time. The Government of Maharashtra promptly sent relevant instructions to all the concerned officials in the form of a printed booklet. This was surely a praiseworthy initiative.

It would be useful in this context to discuss the environmental cost of the forests and the criteria to compute that cost, given in the said instructions.

A simple method has been given in these instructions. The environmental cost of a one-hectare forest with a unit density for a period of 50 years has been taken as Rs 126.74 lakhs. The cost would vary according to the density of the forest. For example the cost of a one-hectare forest of density 0.4 would be Rs 50.7 lakhs.

Some pertinent questions come up in this context. Is it possible to evaluate the various important functions of the forests (like production of oxygen, conversion of solar energy into useful products, holding of rain water, enrichment of the soil and checking its erosion, control of the wind and atmospheric temperature etc.) in terms of money? The Department of Environment ought to shed more light on these aspects.

A natural forest is a balanced co-existence of trees, creepers, bushes, grasses, animals, birds, insects, water, soil, stones, etc. The environmental importance of forests is critical in the context of the life-cycle on earth. How can it be quantified in terms of money? Is it possible for an artificially grown forest to take the place of a natural forest? To be sure, the available technical knowledge does not make this possible. What right then do we have to endanger the life of coming generations by destroying nature? The central government's instructions lack any safeguard against this.

The formation of topsoil of six-centimetre thickness through natural processes takes 2000-2500 years. What could be the formula to evaluate the loss of this fertile soil due to construction of dams and other projects? This point is important especially in the case of projects like Gosikhurd. The felling of trees in the upper catchment area of dams and the submergence of land under water are bound to cause much harm. The loss of soil due to waterlogging and salinity also needs consideration. Government instructions, however, are silent over these points.

For the computation of loss, the woodstock is categorized as teak, non-teak, tendu and fuelwood. The current value is taken into account while computing their cost and the income for 50 years is calculated on that basis. It is important to remember that the yield from forests is now much below the potential capacity due to their degradation and denudation. On the other hand, the maximum potential is considered while calculating benefits of new forests. The government thus applied different criteria for costs and benefits according to its convenience, thereby distorting the whole cost-benefit analysis. It is necessary that the maximum potential of the forests be taken into account while calculating costs, also.

Similarly, the lack of proper methods for evaluation of fodder and minor forest produce has resulted in the insistence by irrigation departments that the auction notes for grazing in the forest and the royalty collected on the minor forest produce be the basis for evaluating their costs. In this case also, the maximum capacity of the forests should be the basis for such computation.

While considering the loss of employment from the loss of forests, only wood is taken into account. In fact, the fodder, the minor forest produce and the processing industries based on them, fishing and the production of honey etc. should also be considered in all cases. The maximum potential of the forests should be the basis of computation.

The cost-benefit analysis should thus be based on a strictly scientific criteria. Only then would the correct picture emerge. We could then decide whether to invest capital and natural resources in projects like large dams or use them for the conservation and development of forest through the unemployed poor. We could then envisage an alternative forest policy.

economic policy and development policy. Such policies would certainly consider the human element, thus ensuring justice and development for all, right down to the last man.

To think that the government alone would do all this would be detrimental not only to democracy, but to humanity as well. It is, therefore, the bounden duty of every citizen to assert his fundamental right to obtain information about and to participate in the administration of governmental policy regarding environmental issues. These should be analyzed on an on-going basis and a collective process initiated to give proper direction to that policy. This task has become extremely urgent. Standing at the crossroads, we are now faced with a choice between real development, and destruction in the name of development.

Resettlement of Large Dam Oustees in India

MANAB CHAKRABORTY

The problem

All over the world the number of large dams has continued to increase. The number crossed 16,000 in 1984 (Roggeri 1985: 7). Of these, by 1979 India had 2422, or approximately 15 per cent of the world's large dams, accounting for 43 per cent of irrigation coverage. By large dam we mean a facility which has a culturable command area of more than 2000 hectares (ha). In Indian official terminology, a large dam would include the category 'major' having a culturable command area (CCA) of 10,000 ha or more as well as the category 'medium' having a CCA ranging between 2000 ha and 10,000 ha. In the case of a purely hydroelectric dam, a large dam would be one generating five mw of uninterrupted power. By implication a small dam would by one with a CCA of less than 2000 ha and whose capacity to generate power does not exceed five mw. The lure of large dams arises from the potential economic and social gains through the production of clean and cheap power, control of floods, drinking water supply and increase in assured irrigation cover. Unfortunately the same process causes displacement of large numbers of people. Some of the dams which have caused massive displacement worldwide are: Volta in Ghana, 78,000 persons; Aswan dam in Egypt, 120,000; Lake Kingi in Nigeria, 42,000. The resettlement of dam oustees all over the world has been hardly satisfactory.

We propose to look into this problem in detail focusing on India. Our purpose is not to question the desirability of large dams on technical, economic or environmental grounds. We insist, however, that proper planning of large dams should include a satisfactory handling of the question of oustees, which is presently not the case in India. In the absence of any census of dam oustees, it is difficult to state the exact number of dam displaced persons in India. One recent estimte considers 21.6 million persons having been displaced (Paranjpye 1986: 14).

Several disquieting features of such large relocation of people demand attention: first, the inadequacy of the State's legal and administrative machinery to handle the problems posed. The required laws, policies and the innovativeness in administration are conspicuously wanting. For example, the legal touchstone underlying compensation of oustees is the antiquated Land Acquisition Act of 1894 (hereafter LAA) which does not go beyond prescribing minimum compensation to legally entitled private property owners. The second disturbing aspect is that relocation is involuntary or forced. People have no choice but to relocate. Thirdly, only a miniscule of the oustees is actually rehabilitated. In the absence of an

adequate rehabilitation policy, their problems often acquire catastrophic proportions. As a consequence, violent conflicts between the people and the State have occurred in a number of instances.

This paper draws on the commonality of experiences of dam oustees in various states of India in order to identify the causative factors responsible for their treatment and the consequences of the resettlement measures followed.

To begin with, we shall discuss some important causes behind the treatment of oustees currently. There are basically three main reasons why resettlement efforts are so faulty:

(i) Lack of an appropriate resettlement policy

(ii) The government resettlement machinery is ill-equipped

(iii) The subordinated position of the oustees in the Indian social hierarchy (because of their low caste and weak economic strength) implies that they have little economic and political bargaining power to exert vis-a-vis other interest groups and the State.

Lack of an appropriate resettlement policy

There are no well articulated national policies on the various aspects of resettlement, viz. land acquisition in submerged zones, allotment of alternate plots to affected families, evacuation and transportation of oustees, etc. Since, for rural families, the acquisition and allotment of land is the most vital issue, we shall dwell on this aspect extensively. Generally, rehabilitation policies are made up by state governments, most often as knee-jerk reactions to the existence and dissatisfaction of populations on land which is acquired for 'public purposes' (Mankodi 1984: 16). The legal cornerstone for relocation is the antiquated Land Acquisition Act of 1894. Precedents set the tone, while court orders and agitations stimulate government response, which is more akin to crisis management. Mankodi (1984: 17) reports that the case of Ukai dam rehabilitation policy consisted of about 20 different resolutions made by various departments of the Gujarat state government over a period of five years. Andhra Pradesh (hereafter AP) government, however, in the early 1960's had a project specific rehabilitation policy. This indeed was the case in Nagarjunasagar in 1960, when the government was willing to take the responsibility of full rehabilitation of the dislocated. However, by 1965, this concern for full rehabilitation had considerably eroded. In the case of Pochampad in 1965 and Srisailam in 1977, AP government did away with the practices of an elaborate rehabilitation policy. Instead, it was replaced by departmental memos and orders to suit the need of the hour (Lakshmi 1982). Obviously, rule by executive fiats gives the bureaucracy greater room to manoeuvre. However, for the potential oustees, it raises uncertainty and stress which could be avoided if the government, at the outset, sets clear guidelines covering various aspects of resettlement.

Land acquisition

In the absence of pre-project consultation with the community regarding the decision to locate the dam site, relocation process begins with the receiving of land acquisition notice. The LAA passed by the colonial government is still intact except for minor amendments. The Act empowers the government to acquire any land for public purpose in exchange for cash compensation. Land is a private property of the legal owner(s), generally the household head. The government deals with the individual owner and not the village as a whole. The Act thus raises certain fundamental problems. **First**, the exclusion of all residents without land. Landless labourers, artisans, sharecroppers, tenant cultivators and people living on collection of forest produce—who together constitute more than 50 per cent of the village population—are not entitled to any compensation. **Next**, very few cultivators have proper legal deeds of ownership. Hereditary usufruct rights are not recognized. **Third**, loss of

common village property resources viz. grazing grounds are not compensated. **Fourth**, the value of the land is calcualted as on the date of gazzette notification and interest is paid only from the date of taking possession upto the date of payment of full compensation. The LAA thus does not take into consideration the escalation of the market value between the time of notification and the date of actual possession. Moreover, to avoid higher incidence of court fees, land transactions have always been fictitiously recorded at far below the real market price. This results in low compensation as the official land prices are undervalued. **Fifth**, cash compensation to an illiterate population with little experience of handling money is considered undesirable as it exposes them to graft, stealing and indiscriminate spending. All these factors mean that the cash compensation for land is grossly inadequate to buy new land, not to speak of indemnifying loss of employment or disruption of livelihood.

In recent years, compensation rates for land have been substantially raised, though this is still far below market rates (see Table 1). Incidentally, public pressure and the recognition of the inadequacy of LAA contributed to this change. The Maharashtra Resettlement Act, 1976, and the Narmada Tribunal Award, made provisions for compensation to the landless too. The judiciary has positively intervened to raise compensation claims. In Srisailam, out of the 20,137 cases filed in the courts disputing orders under LAA, 3358 have been settled, all in favour of the oustees. The government has been asked to pay higher rates of compensation ranging between 12 per cent and 785 per cent. (Lokayan 1985: 101,. Narendranath & Chowdry 1982: 5, Lakshmi 1982: 15).

Table 1

CASH COMPENSATION FOR LAND ACQUIRED: PER ACRE VALUE IN RUPEES ASSESSED BY GOVERNMENTS IN SELECTED DAM PROJECTS

Land quality	SRISAILAM 1977		KOEL KARO 1973	KOEL KARO 1983	TEHRI 1980	
	Govt rate	Market value claimed	Govt rate	Govt rate	Govt rate	Market value claimed
Irrigated (Grade I)	2,332	14,000	2,000	20,000	12,000	20,000
Dry (Grade II)	932	5,000	800	8,000	6,000	10,000
Barren (Grade III)	Nil	Nil	300	3,200	4,000	5,000

Sources: Tehri: Chakraborty 1985; Srisailam: Lakshmi 1982; Koel Karo: Roy 1985 for 1973 figures, Lokayan 1985 and Ankeleshwaria 1985 for 1983 figures.

The present day trend is to pay cash compensation instead of land because of the land policy as evident in the case of DVC, Hirakud and Nagarjunasagar projects, built between 1950 and 1960. There is very little surplus land available now. On the basis of the latest information received on the area declared surplus under various ceiling laws, out of 29.45 lakh acres taken in actual possession, only 9.40 lakh acres remain to be distributed. Most of this is inferior land, thinly distributed in small patches all over the country. Some are under physical occupation of landowners. Hence the 'land for land' policy is thwarted by apparent land scarcity. The Maharashtra Resettlement Act 1976 (Article 16) stipulated the acquisition of land from the benefited zone for distribution among the oustees. Unfortunately, this provision was never implemented due to opposition from the rich farmers' lobby. To our mind, this is the only way to generate surplus land to compensate the farmers in submerged zones.

Another conventional way of generating new land for oustees has been to clear forests. However, the Central Forest Conservation Act 1980, has effectively prevented clearing of any forest land for development purpose. Under these circumstances, the bureaucracy finds it expedient to do away with the 'land for land' policy and rely entirely on cash compensation. To win over the oustees, they are more willing to pay ever higher rates of cash compensation than to take the unpleasant task of acquiring land from the beneficiary farmers. In the ongoing projects of Tehri and Narmada, provision for loans has been made to purchase land from the open market. Such ad hoc measures are based on two assumptions. Firstly, the land offered by the government may not meet the oustees' expectations in terms of location, quality etc. Secondly, it is recognized by the government that the land price in the open market is many times more than the actual compensation amount. Therefore, government loans to individual oustees will bridge the gap between the compensation awarded for acquired land and the market price for the new land. However, in this exercise, the government is able to pass on the burden of the difference in amount, on the oustees themselves. Normative justice demands that government intervention should not leave the oustee worse off than before. It is the duty of the government to restore quality land similar to that acquired. The result is that the relocatees are worse off, impoverished and invariably end up with reduced land holding. In the case of Srisailam for instance, the land holding size of the relocatees declined between 53 per cent and 63 per cent for all categories. Clearly the oustees are paying the price for the development of the command zone without any proper compensation.

Ill-equipped government resettlement machinery

The government not only lacks a comprehensive policy, it has no administrative machinery to render smooth resettlement. At the root of apathy towards oustees and the anarchic style of execution of resettlement programmes, lies an ill-trained bureaucracy. Resettlement involves the cooperation of a number of departments, statutory bodies, civic leaders and affected population. The principal government agencies involved are the departments of irrigation and power, revenue and forest, which function independently. The revenue officials are concerned with assessment of existing property to prepare a schedule of oustees eligible for compensation. The land for new resettlement is either released by the forest department or in case of surplus ceiling land, by the revenue department. They hold joint meetings to sort out problems from time to time. However, none of them is trained to consider rehabilitation as a human problem. Their different backgrounds, departmental traditions and above all, different interests, cause inter-departmental rivalry, affecting the pace of construction and smooth resettlement.

A short-sighted bureaucracy

Scudder (1984) comments: "The strength of irrigation and revenue departments at Narmada Sarovar relates to land acquisition and compensation but not rehabilitation. Their approach to rehabilitation lays emphasis, not on the future welfare of oustees, but on their physical transference from the reservoir basin". The insistence on physical transfer without consideration of the oustees' welfare is detrimental to the quality of resettlement. The insensitiveness of officialdom to oustees follows from two mistaken perceptions. First, the officials consider development projects a good thing, by itself, for all people. In this process the interests and welfare of some groups of people have to be sacrificed. Since the officials believe that the benefits of large projects reach all people, including the oustees, they consider the oustees' welfare of only secondary importance. Secondly, the rehabilitation bureaucracy perceives oustees as an inferior human class. Since a sizeable portion of bureaucracy is composed of non-tribal high castes, they tend to view themselves as superior to the oustees,

a majority of whom is of tribal and scheduled caste origin. Kalpavriksh (1986: 238) reports that rehabilitation officials view tribal oustees in Narmada to be in 'jungle state'. Even as early as 1948, Minister NV Gadgil, in charge of the Damodar Valley Corporation project, ardently believed that "... every person who will be uprooted from the soil ... will exchange his shovel for a decent cottage, darkness for light and fanaticism for faith" (quoted by Bhalla 1969: 70). Such beliefs legitimatize uprooting of people, as the officials perceive their role as that of crusaders to redeem the oustees and incorporate them into the national mainstream. This paternalistic, unilinear view of development inhibits true understanding of the dilemmas that oustees confront. These strains of a colonial administrative culture also prevent any dialogue between the oustees and the rehabilitation administrators.

Rehabilitation: underfinanced

Not surprisingly, therefore, the needs of rehabilitation fail to receive full attention in dam projects. Since there is no organized lobby of oustees, rehabilitation is treated as a residual category in dam projects with a small fraction of finances allocated to it. In Tehri Dam, for instance, only one per cent of the budget was originally allocated for resettlement purposes. This was approximately the same amount spent on setting up housing colonies for Tehri Dam project staff. The lack of finance and overall low priority in allocation of manpower, time and energy has adversely affected the outcome of resettlement efforts. Proper rehabilitation of the oustees would require a large financial outlay. This would, of course, raise the total cost component of dams affecting overall profitability of such projects.

Socio-economic position of oustees

Among the foremost factors responsible for less than fair treatment is the low caste and weak economic position of most of the oustees. Their relative weak, subordinated position in the Indian social hierarchy implies that they have very little political or economic bargaining power.vis a vis other interest groups.Barring a few exceptions, the large majority of oustees comprises low income, low status people who have very little political clout or access to national resources. Studies show that the majority of the relocatees belong to scheduled caste; tribal and hill communities (Lakshmi 1982, Colchester 1985). The last two groups represent historically marginalized communities who have been pushed to inaccessible physical frontiers by succeeding waves of Aryan and later Mughal invasion. Unfortunately their present sites of living offer best geographical sites for damming the rivers.Nearly 82 per cent of the 38 million tribal population lives in central and western part of the country where three-fifth of the large dams are located. Consequently tribals are among the main affected groups. Table 2 brings this point home.

Being in difficult, less fertile terrains, the oustees by and large practise subsistence cultivation before relocation. Among them, the tribals are deeply attached to forests both for cultural and economic reasons. In one study, tribals have been found to derive upto 38 per cent of their income from sale of minor forest produce (GOI 1982: 21). Their relocation to non-forest areas severely upsets their cultural system and sources of livelihood. Much of the minor forest produce (mfp) is used for self consumption to meet the fuel, fodder, fibre and housing needs. Households having less than two hectares of land mainly depend on mfp collection. During adverse conditions and droughts, tribals live only on edible products collected from the forests. No project plan study has taken into account on the cost side the loss of income from mfp or the social security value of the forests submerged. Table 3 presents pre-relocation socio-economic characteristics of Srisailam and Narmada Sarovar (which is in a tribal area). More than one-third of the population is engaged in cultivation of land belonging to the forest department. The absence of any legal deed on these lands,

Table 2

TRIBAL POPULATION IN SELECTED DAMS

Dam/State	Tribal population in the area as %	Source
Koel Karo/Bihar	88	— Ankeleshwaria.1984
Hirakud/Orissa	10.9	— Sovani and Rath 1960: 31 Sambalpur zone only
Sardar Sarovar/Gujarat	51.6	— Verma 1986: 83 only for submergency in Madhya Pradesh
Lalpur/Gujarat	83.2	— HDS 1982: 20 only for Chota Udepur subdivision
Inchampally/ Andhra Pradesh + Maharshtra	20	
Bhopalpatnam/ Madhya Pradesh + Maharashtra	50	— Colchester 1986: 246, 249

Table 3

PRE-RELOCATION SOCIO-ECONOMIC CHARACTERISTICS OF OUSTEES OBSERVED: TWO SAMPLE SURVEYS

SRISAILAM

Population distribution by occupation

Category	% of population	Share of land %
a. Cultivators		
10 acres and above	17	60
5 – 10 acres	16	16
Below 5 acres	36	15
Landless labourers	17	—
b. Artisans	4	NA
c. Business	10	NA
d. Other activities	9	NA

Sample size: 258 households
Source: Lokayan Survey 1985: 99

NARMADA SARDAR SAROVAR

Land ownership

Households owning land	51
Households landless	16
Households cultivating forest land	33

Occupations

Farming/Cultivation	81
Agricultural labourer	4
Forest wage labour	1
Construction contract labour	3
Other miscellaneous labour	11

Sample size: 2224 households, population 14,184 persons in all 19 tribal villages of Mangrol taluka, Broach district, Gujarat
Source: Joshi 1982: 26-27

cultivated illegally with the connivance of forest officials denies the oustees any claim for compensation. In the Srisailam sample, 81 per cent of the respondents belonged to scheduled castes and backward classes who are at the bottom of the Indian social hierarchy (CSE 1982: 63). The respondents debt burden was found to have increased manifold in post-relocation period: a sizeable part of cash compensation was reportedly used towards redeeming debts which further constrained investment into production assets and assets required for agriculture. This factor alone reduced the income of Srisailam respondents to less than 40 per cent compared to their pre-relocation period.

Consequences of resettlement efforts

The half-hearted, ill conceived resettlement measures have failed to provide any satisfactory solution to the problem of oustees. Instead of encouraging popular participation in the development process, such ad hoc measures have embittered the public, impaired social welfare and even attracted hostility towards the government.

Dismal resettlement record

First, because of the various problems discussed above, resettlement remains problematic and unsatisfactory. In our study, we found only in Nagarjunasagar all the 5908 families displaced in 1958 could be fully rehabilitated in 1969. The political will of the government and policy of land for land contributed to this success. Nevertheless, there was a gap of 11 years before everyone could be rehabilitated. According to the figures presented in Table 4, rehabilitation of oustees in other projects has progressed at a snail's pace. Among the more successful have been DVC, Pong and Pochampad, with over 50 per cent rehabilitation rates. As we have seen before in the case of Pong, the figures do not reveal all the suffering oustees undergo. In Ukai, Hirakud and Tehri the percentage of population rehabilitated has not exceeded 19 per cent. This record is all the more disturbing because most of these projects commenced 20-30 years ago. With the current emphasis on purely cash compensation, we doubt whether the oustees can ever re-establish their community life, cultural and social institutions. The record of resettlement till now, in short, has been dismal.

Table 4

PROGRESS OF REHABILITATION

Dam/State	Year of impoundment	Displaced families	Rehabilitated families	Rehabilitated as % of displaced	Source
Maithon and Pachet of DVC/Bihar, West Bengal	1956	3,296	1,861	56	Government of India, Ministry of Home Affairs, Scheduled Castes and Tribes Commission Report 1974, as quoted by Rao 1986: 474
Hirakud/Orissa	1956	1,636	300	18	Till 1981, Verma 1985: 2
Bhakra/Himachal	1959	2,100	730	35	Verma 1985: 2
Pong/Himachal	1962	16,000	9,000	56	Lakshmi 1982: 9
Pochampad/ Andhra Pradesh	1965	67 villages	39—land 28—cash	58—land 32—cash	Till June 1984 Chakraborty 1985: 25
Tehri/Uttar Pradesh	Under construction	8,630 rural	1,212—land 352—cash	14—land 4—cash	CSE 1985: 105
Ukai/Gujarat	1971	18,500	3,500	19	

Impoverishment of oustees

As a compensatory mechanism, resettlement measures pursued presently have failed to maintain the ex ante income and land holding size of the relocated families. This we have already illustrated in the case of Srisailam, where not only the income of relocatees declined by an average of 40 per cent, but also the landholding size reduced for all categories between 53 per cent and 63 per cent (Lokayan 1985: 99).

Clash of government approach and the interest of oustees

Insensitivity to socio-cultural consideration in relocation is by far the weakest link in the relocation process. The government treats each individual in an atomized manner. The oustees, particularly tribals, have strong kinship and community ties. The tribal oustees make every effort to move en bloc to new sites and emphasize on preserving old community ties, social and religious institutions. The approach of the government and the interest of the oustees, thus, act cross ways. For instance, 6800 families of the 16,000 families displaced by Pong dam in Himachal were given land 500 kilometres away in the middle of Rajasthan desert, in contravention of their wish to resettle within Himachal. The new location was completely devoid of water, electricity and other basic amenities. The nearest wheat flour mill was 38 kilometres away. Faced with such adversity, 75 per cent of the families returned to the original area (CSE 1985: 106). In other words, the government's efforts simply boomeranged.

Displacement and rise of new interest alliances

As we have pointed out earlier, large dams consolidate capitalist agriculture. Naturally, it draws opposition from the oustees as well as feudal landlords who feel threatened by economic change. The feudal elements form a temporary alliance with the poor oustees to oppose dam construction in every manner. Hart (1956: 121) vividly describes how the landlords (gaonthias) of the villages to be submerged by Hirakud reservoirs banded together to oppose the project. "It was the abundant employment and relatively high wages which the dam construction offers the cultivators, hitherto held as serfs to their lands for want of other work. Dimly too, some of them realized that the coming of irrigation to Sambalpur district would rend the dependence of cultivators upon their usurious loans in times of famine." The dams simply challenged the existing feudal agrarian structure. This is perhaps an important reason behind the participation of large number of big landlords and middle class farmers, religious institutions with large property and other feudal elements in anti-dam movements in Tehri and Koel Karo. It is no surprise that during the transition phase in relocation, many bonded labourers prefer to move to new places beyond the reach of their erstwhile landlords and moneylenders. To the extent the dams and resettlement programmes damage feudal order in the countryside, it is indeed fulfilling historically a progressive function.

Social inequality

To a small minority, resettlement provides an opportunity for occupational diversification. Individuals with experience of modern world viz. ex-servicemen, government personnel, traders, etc. invest the compensation amount to set up shops, small business, workshops or other non-farm activities. The educated unemployed youth perceive resettlement as an opportune occasion to demand employment in project works, a wish partially accommodated in practice at Tehri and Koel Karo. The existence of divergent interests among the affected population weakens their resistance to the less welcome aspects of the dam projects.

The impact of canal irrigation on social differentiation is well documented (Krimmel 1982, Chattopadhay 1977). In the case study of Tundi village in Surat where Ukai's water has reached, Patel (1982) found that Patidars (rich farmers) have improved their economic position considerably. With the replacement of labour intensive crops like coarse grains to water intensive but less labour intensive crops like sugar cane, cotton etc., the employment opportunities for Halpattis and Dublas (labour castes) declined. The entry of dam oustees as wage labourers in the area further exacerbated competition among the local and new labour groups. The concentration of surplus agricultural income in the hands of the Patidars sharpened the feeling of deprivation among the Dublas.

Social conflict

Systematic denial of fair treatment, lack of opportunities to benefit from dam projects and general impoverishment among oustees have produced strong resistance. Confrontations over dams have intensified as non-controversial sites are getting scarcer and more dams are located in populous zones. As a result, the number of displaced persons per dam is increasing rapidly. With the rise of overall political consciousness of masses of their rights, confrontation over construction of dams is becoming bitter, sometimes even violent. Among these flashpoints are: Koel Karo, Sugathan and Subarnarekha in Bihar: Manibhadra and Rengali in Orissa; Inchampalli and Bhopalpatnam in Maharashtra; Rihand and Tehri in UP. Where relocatees have refused to accept the terms of compensation, police action in forcible evacuation has been reported. In Srisailam, houses were bulldozed and oustees forcibly evacuated. (Lokayan 1985). In Rihand, the reservoir was filled before time to stop a sit-in strike by the oustees. Their leaders were arrested (Singh 1985: 1644).

Alarmed at deteriorating relations between the oustees and the government machinery, in a number of cases the national leaders had to abandon projects. For instance, the Chief Minister of Arunachal, Mr Apang, withdrew the Dihang dam proposal in 1981 as it might have seriously affected one-sixth of the state's tribal population. Similarly, Mrs Indira Gandhi ordered a review of Bhopalpatnam and Inchampalli projects when fears of tribal ethnocide were voiced by Baba Amte and the district administration. In short, the growing discontentment of the oustees is threatening to destabilize law and order situation.

The above discussion shows that despite divergent material interest, heterogenous rural social groups come to form alliances against and for, dam projects. If the middle and rich farmers seeking to diversify in commercial cropping come together with the bonded labourers, on the other side, feudal landlords and other categories of oustees oppose the same projects. Vacillating between the two are educated unemployed youth and landless labourers who may welcome such projects as long as it enhances their employment opportunities. However, since the leadership of both the pro- and anti-dam project remains with the rural elite, the claims of the oustees is usually sidelined. Since the oustees (particularly the landless labourers, marginal farmers, barbers, potters etc.) are unorganized, they are hardly able to defend their rights and mount claim for a larger share in the developmental process.

Summary

In this chapter we surveyed the main causative factors hindering satisfactory resettlement and underlined the consequences of it. The lack of any well considered plan for the resettlement of the 21 million estimated oustees has encouraged the growth of bureaucratic ad hocism. As the land frontiers were reached in early 1960's the government abandoned the 'land for land' policy to resettle the oustees. The switchover to enhanced cash compensation is not satisfactory as this is inadequate to buy alternative agricultural plots at the prevailing

market price. As a result the majority of the oustees finds its landholdings reduced, and without suitable economic opportunities, it faces greater impoverishment. The poor organization of the government resettlement machinery, the short-sighted attitude of the bureaucracy and underfinancing, aggravate resettlement problems. The inferior economic position and low caste origin of the oustees weaken their bargaining power vis-a-vis other interest groups, to claim a fair treatment in resettlement.

The consequences of such faulty resettlement practices are evident in the poor record of rehabilitation, clash of mutual interest between the oustees and the government. The heightened social conflict expressed by various alliances of the interest groups causes tremendous tension in the political fabric which the state overcomes either by crushing the opposition through repressive means or by abandoning the dam project altogether.

Suggestions for future resettlement:

Imperatives for change

The foregoing analysis of resettlement efforts makes it necessary to search for an alternative approach to resettlement within the constraints of the existing social, political and administrative framework. We suggest certain improvements in resettlement without demanding overall restructuring in the political and administrative sphere. There are two major factors contributing to change in the state's approach to resettlement. First, it is the acceleration of conflict over dams due to the growth of resistance among the affected populations. The resistance is likely to become stiffer in the wake of further politicization of the oustees and their cumulative expansion in numbers (which has already touched 21 million by now). The threat of larger social conflict, violence and general chaos arising out of it runs counter to the state's interest as the preservator of social order. It is being realized in many circles that the neglect of the oustees will prove economically and politically much more expensive in the long run unless their interest is well cared for now.

Next, there is virtually a division within the various organs of the state on the question of treatment of oustees. We have already cited several cases where the judiciary took a diametrically opposite stand to the dam bureaucracy regarding the sum of compensation offered (e.g. Srisailam) or violation of the right to livelihood in case of Baurari village under Tehri project. Similarly, in the case of Inchampalli-Bhopalpatnam, the district administration and the prime minister's secretariat halted the execution of these two projects for fear of tribal ethnocide. The conflict of approaches to the oustees issue introduces an element of contradiction which is detrimental to the functioning of the overall political system.

Therefore there is a need to formulate a set of coherent policies regarding resettlement which provides a common code to guide the various functionaries of the state.

To begin with, the guiding principles in resettlement should be:

Resettlement should be seen as a development opportunity to reduce poverty. To meet the goal of social justice, resettlement policies must ensure that the oustees benefit from the development process as much as others. It should therefore leave them better off than before. Resettlement should enhance the social, economic and physical conditions of the people.

Resettlement should be based on incentives and wilful participation of the relocatees. There is no room for imposition or coercion.

The economic position of the relocatees should be improved. They should be prepared to move from subsistence to commoditized economy so that they can take advantage of new economic opportunities.

Resettlement should be planned and located in a rational manner, carefully steered by a team of professionally qualified resettlement specialists.

We believe it is not possible to fossilize tribal culture and identity. Whether we like it or not, the world is turning towards greater cultural uniformity and integration. Precapitalist cultures were necessarily varied because of the direct appropriation of use values. With commoditization, modern development brings diversity in local culture and economy. The integration of various local cultures and economies into larger settings is the political basis of development of the Indian nation state. Resettlement planning, therefore, has to encourage assimilation of various cultures and value systems. The tribals, like other oustees are understandably unhappy when dams usurp their land, home and livelihood. Only when such developments are to their benefit and ensure them of their participation and a decent livelihood, would they be willing to accept change voluntarily.

Changes in resettlement administration

To operationalize what we have said above, a consistent, well articulated policy is required. At the feasibility stage, the social impact of the intended project should be an integral part of investigation. At present, in accordance with 1929 provisions, an all India project is investigated by bureaucrats suggesting that sociological aspects should also be covered and similar provisions extended to state level projects.

The responsibility for the resettlement of the dam oustees is unsatisfactorily shared among a large number of agencies which poses problems of inter-departmental coordination. We propose the entire responsibility is transferred to one agency, namely, the Department of Rehabilitation and Resettlement. Many states and the union government already have such a department to look after those affected by natural disasters. Our proposal would imply widening their scope of operation. This department should be allocated dam-specific budgets and invested with administrative authority to execute its duties. The centralization of all resettlement services would ensure administrative convenience and hopefully prompt attention to oustees' grievances. The department would set up an advisory body at the level of each dam which would monitor progress in resettlement and be the eyes and ears of the oustees' interest. This advisory body should comprise representatives of concerned departments, eminent local citizens, members of the parliament and state legislature of the affected constituency, voluntary agencies working with the relocatees and finally a representative from each affected village panchayat. This forum would encourage popular participation to resolve all outstanding problems regarding resettlement viz. compensation rates, relocation sites, provision of communal facilities etc. Mass publicity campaigns would prepare the community to accept the forthcoming changes relocation entails. This way, traditional leadership would have a chance to participate with other sections for a more stable transition.

We would also suggest that the union government sets up a commission to review the problems of resettlement encountered in various dam projects. The commission should come out with a model framework to guide the treatment of resettlement aspects. Obviously, suitable amendments in the Land Acquisition Act (among other Acts) have to be incorporated to overcome some of the shortcomings already discussed.

Generation of new economic opportunities

The major thrust of any resettlement programme must be directed to restoring the livelihood and economic well-being of the oustees. Generation of new economic opportunities is one way of countering the marginalization effect which displacements have tended to exacerbate. Unfortunately, since alternative employment and income opportunities were not

tapped systematically, this aspect has remained neglected in conventional resettlement schemes. The oustees can be largely absorbed in farm activities and a small section in non-farm activities. The crucial question is how do we make available enough land or an alternative basis of subsistence for the oustees. The various farm and non-farm options which may satisfy livelihood requirements of the oustees are:

— Farm based: agriculture and afforestation.

— Non-farm based: pisciculture, navigation, direct employment in the dam project, secondary activities like trading and services.

Since more than two-third of the oustees is in farm-based occupations, our main focus shall be the sphere of agriculture and afforestation. Only through a combination of opportunities created in different sub-packages (modules), is it possible to show that by adopting the modules suggested by us, it is possible to rehabilitate all the rural oustees of Tehri dam.

Alternative module 1: Agricultural land

Extra land could be made available to oustees in two ways:

(a) market purchase of land in command zone;

(b) acquisition of land in command zone.

Irrigated agriculture requires more investments in terms of input and labour. Many large landowners may find it impossible to raise such investments for proper utilization of available land and may, therefore, sell a portion of the land. Our suggestion is that all land sold in command zone be exclusively reserved for the oustees for a reasonable period, say 10 years. This will give an opportunity to the oustees to buy land in command areas.

The government may enact suitable laws to selectively acquire land in the command zone. Acquisition of land from large landlords in the beneficiary zone for redistribution among the resettlers would prove to be a populist political measure. Given the environment of accelerating social conflict between the oustees and the government, land distribution in this way means less social conflict in future.

Alternative module 2: Afforestation of public land

It is suggested here that no more new forest land is opened for agricultural uses. Instead resettlement is used as a means to promote afforestation of degraded public land. Narayan and Babu (1984: 36) estimates that out of the 75 million ha of India's forest about 20 million are in degraded conditions. It has been estimated that whereas the Tehri dam oustees resettled in poor agricultural lands of Bauriwala earned on average a return of Rs 6000 per ha, the net return on similar lands engaged in afforestation was nearly double. A well cared two ha plot can provide decent income to each oustee family. Afforestation schemes require long term subsidy from government, backed by technical assistance of concerned agencies. Afforestation measures would also conserve top soil, add nutrition to soil, provide fodder and fuelwood for domestic needs.

Alternative module 3: Non-farm based activities

Large dams open up vistas for occupational diversification and with an expanded market scope for commodity production. All efforts have to be made to ensure that the oustees benefit from the structural changes in the economy.

First, let's take the case of fisheries development. According to Verma (1986: 438), scientific pisciculture practices in four Narmada projects are expected to generate 3900 tonnes of fish per annum, providing full-time direct employment to 25,000 fisherfolk and indirectly to another 2500 persons in allied occupations viz. hatchery management, fish packing, marketing etc. However, to ensure that the benefits go to the oustees, fisher persons' cooperatives of the affected people should be awarded contracts on preferential basis for commercial exploitation. In Rihand and Chambal, unfortunately, commercial rights have been auctioned to non-oustees, which means that the maximum benefits could not percolate down to the local people. Similarly, as far as possible, local people should be offered employment in clerical (Class III) and manual (Class IV) cadre. Though, this is agreed to in principle, in many major dams under construction (viz Narmada and Koel Karo), there must be a local machinery to monitor its enforcement.

Attempts should be made to provide training to the rural youth with a view to equip them in jobs like blacksmiths, carpenters, bulldozer, tractor and truck operation. The Industrial Training Institutes (ITIs) should be set up before dam construction begins so that skilled manpower is locally available at the right time. The nationalized banks may provide special credit to peasant producers to supply articles of daily requirements (viz. vegetables, grains, egg, milk etc.) so that they benefit from the presence of a large number of project staff.

In order to implement the packages we have proposed, planning has to be both decentralized and participatory in nature. Within each dam affected zone, micro area planning has to be carried out to determine the land to be redistributed, vocational profile of the oustees, credit requirement and scope of new economic activities. The thrust of the alternatives we have suggested is based on rational land management, environmental enrichment and sustainable development. Our approach minimizes social disruption while promoting growth with social justice.

A note of caution

We may hastily add that given the prevailing social, political and administrative framework, there is no surety of improved benefits outlined above reaching the oustees. All the factors cited earlier (differential power etc.) having biased benefit flows in certain directions, are still present. Only when the coalition of the oustees and the sympathetic elements in the bureaucracy, judiciary, intelligentsia and other forces apply pressure and influence on the state machinery, the biased benefit flows can be corrected. This calls for continuous struggle to nullify the factors hindering fair resettlement. The operationalization of alternatives outlined above, therefore, depends on the attainment of sufficient political power by the oustees to implement genuine resettlemnt programmes. At Tehri and other dam related movements in India, we are witnessing only the beginning of such a coalition. Till such time when such a coalition becomes a powerful factor in the development process, it is unlikely that alternative resettlement programmes will be fully adopted in Indian water development plans.

Conclusion

What emerges is that in the interplay of various target groups in the public and private realm, the interests of the primary target groups are adequately protected and so are those of the contractors, engineers and irrigation bureaucracy. The interests of the oustees are systematically neglected. The oustees constitute invariably the poor, tribals, hill folk—in general the backward communities of India. They are the victims rather than the beneficiaries of the dams. Dams have enormously strengthened the economic and social position of the rich

farmers in the command area for agricultural resettlement of the oustees. Beneficiary target groups must pay their due share for the improvement in their economic infrastructure. However, till now the beneficiaries have been able to avoid bearing the negative impact of large dams, simply transferring the costs to oustees whose weak socio-political position circumscribed their resistance to unwelcome aspects of development process.

The lack of comprehensive policy governing rehabilitation results in ad hoc measures and manipulative administration. Where public pressure is strong, concessions are made but in a large number of cases where people are unorganized—the governments have been simply unable to appreciate the requirements of meeting justice in resettlement. In future, the oustees have to be treated as full citizens, not 'junglees' as privately some officials view them to justify their unequal treatment. The escalation of conflict on large dams signifies a new level of politicization to which the state must promptly respond to, to neutralize its destabilizing influence on the social order.

What we require is a radical change in the legislative and policy framework as well as administrative reorientation to bring about improvement in resettlement planning. A cadre of socially sensitive administrators, professionally trained in resettlement, may reduce the scope for administrative mismanagement and conflict with the oustees. The demand for more progressive policies has already been voiced by several dam related movements. A small section of the bureaucracy has also called for proper rehabilitation of oustees among major donors. The World Bank, which is financing the Narmada dam, has expressed concern about the inadequate level of cash compensation and the need to ensure "... the protection of all project oustees ... and restoration, at a minimum of the standard of living they were enjoying prior to their displacement" (CL Robless, Chief, India Division, World Bank in his letter to Oxfam, UK dated February 4, 1986). The combined pressure of oustees, judiciary, a section of the bureaucracy, international donors and above all the looming spectre of conflagration is pressing all to search new vistas of resettlement. We hope that the Union Government of India will respond to the need of the hour and formulate comprehensive resettlement policies before it is too late.

Appraisal of Resettlement and Rehabilitation

KASHYAP MANKODI

Introduction

Forced resettlement of large numbers of people is a disaster which must always be avoided as far as possible. In spite of the fact that millions of people all over the world have been subjected to involuntary resettlement schemes, the story of such schemes is largely one of failure, of various degrees. There certainly have been cases of relocatees improving their standards of living over a period of time, but completely painless and unexceptionable cases of successful resettlement and rehabilitation (henceforth R&R) would be quite difficult to find among the large number of documented literature. By 'painless' here is not meant free of the grieving for familiar, comforting surroundings which are lost irretrievably—for clearly no forced resettlement can ever be painless in that sense—but free of hardship and suffering which could have been minimized, if not altogether avoided.

The suffering which relocatees have gone through, have been many and tragic:

—being forced to march on foot for 160 miles when the sick and the old had to be mercilessly left to die on the way and several dozen babies were born without their mothers being able to rest even for a day, as the Yavapai tribals were compelled to do when their ancestral lands in Anzona were taken over for mining in 1875;

—using up food stocks, slaughtering and disposing of their animals, packing their belongings, removing and selling the roofs and windows of their houses, in preparation for resettlement when the shops in the village had also closed, only to find that resettlement was indefinitely postponed, as happened to some Nubians at Aswan in 1963;

—having to leave traditional habitat in hills and forests and near sources of water and being cramped in crowded, unhealthy and uninhabitable colonies often without minimum necessities like drinking water;

—losing land, income, homes, work and productive routines and becoming paupers with nothing to do but turning to drink or crime or migrating in search of work;

—being plucked out of isolation, and stable, low energy, sustained-yield systems of subsistence in a distinct socio-cultural milieu and thrown into the deadly market-

place of land with no protection against exploitation, cheating, avarice and hostility of outsiders whose worldly ways are strange and incomprehensible, but backed by the law and the police, and capable of hurting.

The list can go on and on, because the slings and arrows of outrageous fortune that relocatees are heir to are many. One may well wonder if anything that entails such hardships and sufferings for so many can be really necessary and worth its price, and question the glib assertion of a wider national interest which is invoked to justify local sacrifices. Exactly how wide is the wider interest, and how costly is the local sacrifice—or how well distributed is the gain, and how bearable the pain—are questions that not only may, but must be asked. Exposing the hollow claims of vested interests to speak for the nation when their actions create two nations where there ought to be only one, and documenting the extent of local suffering and its social cost should help in containing the recurring disaster of relocation. The hardships and sufferings of relocation should be seen primarily as a diseconomy, and not an abomination on sentimental grounds.

It is not the intention of the author here to raise the question of balancing national and local interests fairly, or to discuss ways and means of doing away with the disaster of forced relocation, or raise other related political and moral problems. However, it is assumed for the moment that development projects will continue to entail displacement of large numbers of people, irrespective of the consequences. The question examined here is what can be done to soften the blow of dislocation, to mitigate the impact of relocation? The long term policy measures and statutary changes that any answer to this question would suggest would also be implicit in the discussion. Specifically a checklist of questions that should be raised with respect to every programme of R&R in order to gauge its soundness, completeness, and feasibility, are dealt with. Though these questions have taken shape in the context of the massive and poorly understood problem of forced migration due to man-made lakes in India, they would be relevant for other planned involuntary resettlement schemes, too.

These questions are not deduced from some perfect scheme of resettlement and rehabilitation—but have arisen from the actual experience with R&R programmes, and the recurring mistakes and flaws therein, documented in literature from different parts of the world, especially pertaining to developing countries where the problems of forced relocation are most acute. Apart from the direct accounts of involuntary resettlement appearing in journalistic or scholarly writings, the author's personal observation of a few R&R programmes—completed (Ukai), ongoing (Sardar Sarovar, Narmada) or proposed (Koel Karo)—the policy guidelines laid down by the Ministry of Home Affairs of the Government of India and the World Bank, have been consulted for the purpose of drawing up the checklist of questions.

The World Bank's Operational Manual Statements about social issues associated with involuntary resettlement in projects financed by it, and about tribal people affected by such projects are of special interest here, since the World Bank has been compelled to devote considerable attention to the destruction and dislocation caused by development projects financed by it, in the face of strident criticism from human rights and environmental activities. The problem has raised certain concerns and questions of values. This checklist of questions seeks to initiate a debate and generate proposals to ensure that development projects which violate basic human rights and environmental considerations are not pushed through with impunity merely because awareness of their negative effect is fragmented and localized.

The performance of R&R schemes and their lessons

There are two reasons why the checklist of questions for the appraisal of R&R schemes cannot be deduced from some perfect scheme. The first is the fact that location-specific

variations would make it unlikely that the same scheme would be applicable in two situations where the economic base, social characteristics like level of education, awareness, skills and the capacity for change, and the cultural traditions of groups of people are widely different. Thus the resettlement or relocation, and rehabilitation or the rebuilding of the economic and social life of tribals who have an ethnic, linguistic, and cultural distinctiveness and who have lived in relative physical, economic, and social isolation, would pose problems which are special and quite different from the equally special problems of, say, slum dwellers who are highly integrated within urban life. Such differences would necessitate different priorities in housing, transportation, or the provision of employment opportunities, and therefore it is dangerous and risky to try and transfer experience from one environment to another.

The second reason why no uniform sheme of R&R would do is also based on the fact of location-specific differences. There is always an element of judgement involved in deciding the optimum scheme for a given situation. If the R&R programme provides too little, it might lead to a feeling of neglect and despair among the relocatees. On the other hand, if it provides too much, it might lead to dependence and apathy, and kill the relocatees' capacity for initiative and innovation. Hence it is not as if a master list of all the facilities, amenities, services, and benefits that an R&R scheme may provide, can be drawn up, and this single most elaborate scheme applied universally. A good R&R scheme must be fully informed about particular situations, and tailormade to suit them. It should seek the golden mean between summary eviction without any compensation or alternatives, and the other extreme of spoonfeeding unimaginative welfare measures which can be almost as harmful to the oustees. Aborigines in Queensland, whose ancestral land was acquired for its rich mineral deposits, had to be restricted to five cans of beer a day—except on Fridays when they could drink six—because, as the white settlers perceived it, they had been pampered too much and thus killing their initiative.

The lessons to be learnt from past mistakes—or the questions to be asked for every ongoing or future R&R programme—have been arranged in a very rough chronological order in the following checklist.

A checklist of questions for R&R programmes

1. Is resettlement unavoidable? Is it possible to modify the project and implement it without forced relocation of people? Is it a guaranteed, one-time affair? Sometimes the same people are repeatedly ousted with impunity.

2. Is a realistic estimate of the cost of R&R accounted for in the project cost?

   The official total outlay on rehabilitation for the Ukai project was estimated to be Rs 123.10 million. According to our calculations the socio-economic cost of rehabilitation which should be added to the official estimate, is Rs 109.50 million. (That this estimate is not excessive is indicated by the fact that during 1984-85, the Government of Gujarat sanctioned an outlay of Rs 52 million for the economic reconstruction of the affected area). Furthermore, the ecological cost of R&R at Ukai was Rs 668 million on a conservative estimate. Taking into account the contribution of relocating the displaced population on forest land to the curtailment of the useful project life, the total cost of R&R at Ukai was Rs 911.66 million, or 7.4 times the official estimate.

   Though it is no longer possible to resettle oustees on forest land—the main reason for the R&R cost overrun at Ukai—it is still pertinent to ask if a detailed cost estimate is accounted for in the project cost, since that could well make the project economically unviable.

3. Is the identification of the relocation component initiated at the same time as geological and hydrological surveys, and has enough care been taken in planning the relocation component to avoid time and cost overruns?

Quite often the forced resettlement entailed by the project is a knee-jerk reaction to progress in project implementation—'the dam will soon be closed and the waters will rise, so let's get the people hell out of the area'. This can also be the main reason for cost overruns and poor rehabilitation.

4. Does the resettlement component include all of the following:

a. preparation of the affected population for transfer
b. transportation of the diplaced to the new site
c. integration of the displaced with the host population
d. required institutional and legal arrangements
e. sufficient provision for "soft" expertise, i.e. sociology/anthropology
f. R&R options and implementation stages.

To date an affirmative answer to this question is the exception rather than the rule. The oustees may be taken completely unawares. Transportation arrangements might be insufficient. The oustees and the hosts might live—and often die, as in Garudi—in perpetual hostility. Government resolutions are issued continuously to meet eventualities. Nobody who can really understand the oustees and their problems is involved in the R&R, which is coercive and chaotic.

5. Is the exact number of persons who have to be resettled, known in precise detail? This should include various categories of oustees like those who will be displaced by submergence, canals, colonies, dykes, power houses, workshops and other works.

Even in a prestigious project like the Sardar Sarovar Project this list is often incomplete or lacking.

6. Were the affected people consulted or at least kept informed about R&R? Were they given any choice?

Some of the oustees of Ukai learnt about relocation only when the trucks arrived to carry away their belongings, and the only choice some of them had was to accept Rs 450 and disappear, or else face forcible eviction.

7. Are the oustees or at least local leaders involved sufficiently in R&R, or even informed about R&R plans? Is there any information/education programme for them to explain the nature of the project and its resettlement component?

More often than not the plans are made in say Gandhinagar, modified in New Delhi, and approved in Washington, while the oustees are themselves blissfully ignorant.

8. Will there be communal relocation, that is, would most people continue to live with or near their kinfolk? Would the oustees' preferences in this regard be solicited and taken into account?

This question is particularly relevant for tribal oustees.

9. Is there any special provision for widows, orphans, the handicapped or other destitutes who may face special problems if their supportive communal environment is disturbed?

It has been observed that with the socio-cultural dislocation following forced resettlement the oustees often tend to drop their social obligations causing maximum distress to the most vulnerable members.

10. Is enough known to project authorities about the socio-cultural milieu of the oustees?

The economic life of the oustees may be more visible than the social and cultural life, though both can have serious repercussions when disrupted. The marriage distance, fairs and festivals, hunting expeditions or other activities and the fall-out area of resettlement should be sufficiently understood beforehand. Apart from submergence, resettlement, and host villages, there are bound to be other affected villages—the fall-out area—whose socio-cultural and economic ties with the submergence area are disturbed. These are exchange specialist services—healers, sorcerers, exorcists, priests, masons, carpenters, blacksmiths, potters, barbers, musicians, irrigators, seed growers, distillers, musclemen, moneylenders—with the oustee villages.

11. Is any special attention paid to the problems the women, the old and the infirm face during resettlement?

12. Is there an accurate inventory of assets that could be lost and therefore would have to be compensated for?

There should be no eviction without full compensation. Assets to be compensated must include land—both private and forest or wasteland cultivated "unauthorizedly"—houses and other buildings like barns or sheds, public buildings and places of worship, standing crops, wells, trees, commercial enterprises, and loss of income, especially for wage labour and share-croppers. If land is not a marketable commodity usually, it is unrealistic to rely on the so called "market value" and its capitalized income value should be computed. Valuation of assets apart from being fair must be complete, and include rights over, or access to, pasture, forests, water, employment and market.

13. What is the time schedule for the payment of compensation? Will it be paid when it is most needed?

Very often compensation is not paid in time and this makes proper rehabilitation very difficult.

14. What precautions have been taken to ensure that middlemen/sharks like moneylenders, lawyers or touts would not pocket most of the compensation paid? Is cash compensation given judiciously and after due care? Compensation in kind—where possible—is preferable since liquidity cannot always be contained.

15. How would the itinerant population of the affected area like pastoralists or craftsmen be compensated for their loss?

Those living off the land are not always rooted to it.

16. Have land records been properly updated and have legal heirs been identified and located?

This is perhaps the most common problem encountered during resettlement. Quite often e.g. at Koyna—absentee landlords are compensated while the interests of the real tillers of the land are ignored.

17. What are the administrative arrangements for disbursement of compensation? Are they as corruption-proof as possible?

Public scrutiny here is a must, though at present the oustees themselves often do not know what they are entitled to and hence can be quite easily cheated.

18. Is there any escalation clause for delayed compensation?

19. Who will undertake R&R? Has a proper agency been nominated/appointed for it?

20. Is this agency properly staffed and financed?

The Directorate of R&R at Sardar Sarovar Project has a driver but no jeep. It has plans but not enough funds for implementation.

21. Does the agency have experienced/trained personnel?

Most often R&R is in the hands of engineers or revenue department officials whose background, training, and preparedness for R&R is lacking.

22. Are R&R officials accessible or available on the spot?

An oustee in a remote village cannot take his problems to the state capital. There must be a trained worker available on the spot for a given number of oustee families.

23. How will this agency co-ordinate its activities with other departments? What are its lines of communication?

An agency for R&R cannot work in isolation. Apart from being properly staffed and financed it must be adequately prepared for the tasks and challenges of development administration.

24. Can this agency synchronize its plans for R&R with the stages of project implementation?

The period of suspense involved for the oustees must be as short as possible. The agency must synchronize evacuation not only with project progress but with the preparation of resettlement sites, which should be ready before evacuation, unlike at Aswan. It should have a clear idea of the number of people choosing specific alternatives among those made available, say for example fishing by the lake or farming further inland.

25. Can the agency implement the R&R scheme and restore previous income levels or standards of living of the oustees at a reasonable cost?

Though R&R should not necessarily be economically viable on its own, it should implement the scheme within a reasonable level of establishment costs and administrative overheads. This is important because the latter are not always taken into account in the overall project cost and the agency can thrive disproportionately at the oustees' expense.

26. Have proper institutional and legal arrangements been made for R&R? Are compensation and rehabilitation grants exempted from loan recoveries or outstanding debts of the oustees? If resettlement is on land that the oustees have to purchase, are they exempted from registration fees, stamp duties, and other legal costs necessitated by resettlement?

27. Are relocation sites properly planned? Is the land and property properly valued, available, and accessible to the oustees?

In the Sardar Sarovar Project some of the oustees were resettled on government wasteland which was earlier cultivated by the host population. Hence there is encroachment on this land by the hosts and it is not really available to the oustees. Also some of the oustees from Maharashtra were compensated quite

poorly for their agricultural land whereas they may end up paying much more for barren and degraded government land in Gujarat, formerly covered by forests, which requires costly improvements like removal of tree stumps and levelling.

28. Are new settlements planned as expanding or growing socio-economic systems with increasing collective needs over time?

The physical and social or community infrastructure—land base, housing, feeder roads, employment opportunities, social services, marketing needs—have to be planned for a population that will expand. The requirements of the future generations must therefore also be taken into consideration, to ensure the socio-economic viability of relocated communities. If this is not done the social cost of resettlement in terms of disillusion, suspicion, inactivity and temporary or permanent migration from the resettlement zone, will be very high. In some resettlement sites at Ukai more than three fourths of the population was forced to migrate.

29. Does the layout of the relocation sites reflect the needs of the oustee settlers—daily and long term—or is it a planner's dream and the inhabitants' nightmare?

Apart from not having enough scope for expansion these sites often have a distinctive drab look of houses arranged close together in straight parallel lines which violate the oustees' idea of the use of space. The Nubi oustees of Aswan were used to having—and needed—a bench outside their houses which was not provided in the new sites, whereas they associated squatting outside their houses by the roads with an ethnically different people whom they looked down upon.

30. Can the new housing accommodate everyone or will households have to split up?

31. If houses are provided can they be maintained by the settlers?

32. If oustees will build their own houses are arrangements for temporary shelters made?

In the Sardar Sarovar Project such temporary sheds have been provided but they are so unimaginatively and badly constructed that hardly any settlers use them.

33. Are adequate drinking water facilities available for the settlers, their cattle and the host population?

Dam oustees are typically from riverside villages and used to plentiful water. In their resettlement sites if only one or two standposts are provided to cater to a large number of people and livestock, and if handpumps frequently breakdown as they often will, the plight of the settlers can be imagined. If there is any glaring difference in the facilities provided to resettlers, the host population will become hostile. It is therefore very important to provide enough clean drinking water for the resettlers, the hosts, and their cattle, as also other services/facilities.

34. Are adequate health/medical facilities available in or around the resettlement sites?

Increased morbidity and mortality among both people and livestock is frequently encountered following relocation, hence this should be constantly monitored and adequately provided for.

35. Have arrangements been made to incorporate oustee settlers in local self-government? Is the local administration prepared for their influx? Can they vote in the resettlement sites, for instance?

36. Can the resettlers maintain the services made available to them? Can they afford the upkeep of handpumps, roads and other public amenities or has some arrangement been made for it on a long-term basis?

Sub-standard culverts which have collapsed and unusable roads in the resettlement zone of Ukai which the oustees cannot either repair themselves, or have repaired, tell their own story which is far from being unique.

37. Is the resettlement site in any way hazardous to the human or animal population to be resettled?

38. Is the relocation site acceptable to the oustees in both physical and socio-cultural terms like ethnicity, customs, etc.?

The hillmen oustees of Pong dam were sought to be resettled in the desert. Oustees used to receiving brideprice have been resettled where giving dowry is the custom. Such anomalies can seriously hinder integration with the host population

39. Are the oustees relocated in an area where their existing skills and aptitudes can be readily employed?

Forest dwellers in deserts and fishermen on dry hills cannot ply their original trade.

40. Is care taken to encourage the emergence of recognized community leaders, increase participation and stimulate local initiative, or are all decision making and managerial functions monopolized by the bureaucratic agency personnel?

As mentioned earlier, no relocation can be totally free of pain and resentment. A positive answer to this question can help in preventing the emergence of self-seeking leaders who like to fish in troubled waters.

41. Are any undue restrictions contemplated on resettlers' activities like farming, extending their homes, building shrines, etc. in the resettlement site?

42. During actual shifting from the old habitations to the resettlement sites, are adequate arrangements made for transporting the people, their belongings including goods like grain stocks, fodder and firewood and cattle?

The value of a poor oustees' meagre belongings may not be always appreciated by urban bureaucrats. A top-ranking bureaucrat in Gujarat made fun of some oustees of Sardar Sarovar Project for wanting to use trucks provided for transportation to carry organic manure. For a city-bred man it is filthy, and to be thrown away. For a peasant it is a most valuable commodity which must be husbanded carefully, especially when setting forth to till unknown soil which may be depleted or poor.

43. If villages are shifted en masse what arrangements for food, fodder and water have been made during transportation?

44. During shifting what will happen to the sick, physically handicapped; and the infirm? Do special arrangements exist?

45. What will be done about people who refuse to move?

It is too easy for an insensitive bureaucrat to use threats or coercion to achieve relocation targets. It has happened at Ukai and Narmada and wherever oustees are insufficiently organized. Police and bulldozers are not solutions to genuine problems oustees may have.

46. If the oustees are tribals, does their relocation seek either to forcibly integrate them with others or to perpetuate their isolation?

Tribals often live in relative isolation—geographical, ethnic, linguisitc, economic, political and social—and are only partially acculterated into dominant norms of the wider society. They are usually closely identified with territory but many have a loose tenure over traditional land and weak enforcement capabilities against encroachment. Their approach may be cautious and subsistence oriented just because they have no margin of capital or energy to risk in experimentation. For all these reasons special care is needed in the resettlement of tribals. Extremes of forced integration or isolation should be avoided. Also land in lieu of land acquired from tribals, and genuine communal resettlement are mandatory. Emergency acquisition of tribal land for "public purposes" should be resorted to very, very sparingly, if at all.

If it is not possible to restore acquired tribal land in toto, employment must be provided to at least one member of every household. Planning for education/training for employment and the encouragement of enterpreneurial skills with required inputs like finance, marketing outlets, raw materials, etc., has to be undertaken well in advance.

47. Is there any provision for food subsistence of food-for-work programmes for the needy? If so, for how long?

48. Are land clearing/levelling, stump removal and other improvements done for new farm land? When will they be done?

49. Who will do the reclamation if it is needed in the resettlement sites? Can the oustees do it unaided? Where will the finance, labour, and organization come from?

In a well-planned scheme, a single imaginative strategy for the preceding three questions can be worked out. If there is a gap in the agricultural season because of resettlement and land reclamation, a well-planned food-for-work programme can mitigate the hardships.

50. What arrangements have been made to ensure that compensation for acquired assets and rehabilitation grants meant for rebuilding the economic base of the resettlers is not used up for consumption purposes?

Especially for tribal oustees, care should be taken to generate a steady income from compensation and rehabilitation grants, otherwise it is more than likely that most oustees will use them up for consumption. The compensation and grants should be enough first of all to improve capital structure. At Ukai, for instance, they barely sufficed for survival.

51. If the land holdings of the oustees are not required in their entirety, will the oustee resettlers end up having two widely separated parcels of land?

In the Sardar Sarovar Project some oustees have lost half their land in the old village and acquired land instead in a village over 50 kilometres away. It is unrealistic to expect them to cultivate both. Others have found that their land is not required and hence is not acquired, even though it will become totally inaccessible following submergence.

52. Will preference be given to oustees in employment generated by project implementation? If yes, will any savings scheme be arranged for them?

Quite often pliable outside labourers are given preference over oustees who know each other and hence can organize themselves over demand. It is more

common to see liquor dens to separate labour from wages even in a dry state like Gujarat.

53. How soon can the oustees recommence economic activities in the resettlement sites?

The longer it takes the greater the chances of their lapsing into despair and dependency.

54. Will the oustees regain or improve their standard of living following resettlement?

55. Will the resettlers be socially and economically integrated with their host communities?

The trend at present is of increasing hostility due to increasing pressure on host village commons (like grazing land) following resettlement, epitomized by deaths due to police firing in village Garudi in north Gujarat.

56. Who will receive land in the resettlement site?

Land records, as mentioned earlier, are hardly ever up to date. Sometimes tribals do not have titles to their land, or they may depend on land cultivation which is in a technical legal sense "unauthorized". The numbers of persons depending on given parcels of land may exceed the number of legal owners. Will all these be compensated for land acquired and get land in resettlement sites?

57. Is the land in resettlement sites to be allotted to oustees or purchased by them? If it is to be purchased who will pay for it, to whom, and how?

Quite often oustees are not equipped to deal with the intricacies of land purchase. They fall easy prey to cheating, extortion and other sharp practices by unscrupulous elements who often act in collusion with the bureaucracy. It is observed at Sardar Sarovar project where most oustees so far have had to purchase land that they are charged higher prices, sold parcels which are smaller in area than paid for, often without clear titles and vacant possession, are made to pay bribes, and made to sign agreements which jeopardize their interests. All this happens while the deals are overseen by an official land purchase committee.

58. When will the title to the new land be transferred to the resettlers?

Most often delays are due to corrupt practices like the demand for bribes. Sometimes the land is encumbered. Ironically, sometimes the delay is due to the provisions of special procedures for tribal land alienation, even when the oustees are tribals, as in the Sardar Sarovar project. The net result is that the resettlers are unable to secure loans or avail of other facilities in the absence of clear titles to their land.

59. Will the resettlers be given at least as much land as they had before?

60. Is the land suitable for the type of cropping oustees are used to? If changes in agricultural practices will be made necessary have preparation been made for them?

61. Have provisions been made for the required agricultural inputs?

These may include irrigation, manure and fertilizer, seeds, pesticides, markets, transportation, credit, storage and refrigeration, extension, etc.

62. After how long will farmers become self-sufficient in food production? What happens till then?

63. Is fishing going to be encouraged systematically? Who will do the fishing, and how? Will outsiders/middlemen reap most of the profit?

64. Will fishing be labour or capital intensive? How many will gain employment from it? Will oustees benefit from it? Will it be licensed?

65. Where will the required equipment come from?

    This may include boats/canoes, motors, fuel and servicing facilities, gill nets, cast nets, hooks, refrigeration and storage facilities, containers, overland transportation.

66. Is any extension programme for fisheries development planned?

67. When will the R&R programme end? What specific time-bound targets are set for it?

68. What sort of monitoring/evaluation/feedback and corrective mechanisms have been set up in the programme?

69. Finally, what is the nature of the guarantee that a sound, complete, feasible and appropriate R&R plan will be implemented by the state? Will it be in the nature of charity or will it be backed by statutary obligations? What would be the redressal mechanisms in case of default?

Concluding remarks

The preceding set of questions should provide a tool for an incisive scrutiny of programmes of resettlement and rehabilitation. The aim of R&R should not be merely to contain discontent, but to win the trust, confidence, and participation of oustees. For too long has it been assumed that "progress" means the creation of a large body of people into whose lives outsiders may intervene with impunity.

These questions assume instead that R&R schemes cannot and should not be implemented without an understanding of, and respect for, oustees, who should be partners in the project, and not its victims.

As a result of this assumption the questions emphasize the human rights aspect of relocation. It must be remembered that resettlement should also be environmentally sound After the ban on releasing forest land for resettlement there is less need to worry about a massive environmental fall out of resettlement as happened at Ukai where thousands of hectares of prime forests were sacrificed for relocation of oustees. However, the environmental soundness of R&R should also be scrutinized more carefully than has been attempted here. It is to be hoped that just as environmental degradation and socio-economic disruption feed on each other and grow bigger, the arresting of social, cultural, and economic dislocation will enrich the environment of involuntary resettlement sites.

THE INDIAN CASES

Hirakud Dam Project: Expectations and realities

S K PATTANAIK, B DAS, A MISHRA

Hirakud Dam, the largest earth dam in the world is built on the river Mahanadi. Located 9 miles upstream of Sambalpur, it functions as a hydro-electric project, a reservoir and an irrigation project. The project has been named after Hirakud Island (Diamond Island) where once diamond was mined by a class of people called Jharas.

Orissa is traversed by 10 rivers, the Mahanadi, the Brahmani, the Baitarani, the Burabalang, the Subarnarekha, the Rushikulya, the Vansadhara, the Nagavali, the Indravati and the Machhakund rivers. The first three are principal rivers. They all run parallel to each other and join the sea directly. Between them they carry 107 million acre-feet of water each year to the sea, a volume three times that of Lake Mead, the biggest man-made lake in the world, formed by the Boulder Dam in the USA, with a capacity of 32 million acre-feet. The Mahanadi, true to its literal meaning viz, the great river, is the largest of the three principal rivers with a total length of 533 miles. It rises in the highlands of Madhya Pradesh near Sihawa in the extreme south-west of Raipur district. In the first part of its course, it flows to the north. On entering the Bilaspur district, it is joined by its first tributary, the Seonath. It flows in an easterly direction through Bilaspur. The other two principal tributaries that join it are the Jonk and the Hasdeo. It enters Orissa in Sambalpur district and turning south flows south and south-west through the district. In Sambalpur it becomes a major river with a width of more than a mile. Its tributaries here are the Ib, Ong and Tel and numerous minor streams. It subsequently forms a series of rapids until it reaches Dholpur, where the rapids and the river roll mightily towards the outermost line of the Eastern Ghats. It enters the delta area of Orissa at Naraj between two hills, a mile apart, about seven miles west of Cuttack. It divides itself into two streams, the Kathjori and Mahanadi, each branching off again into many streams and traversing the Cuttack district from west to east, before the numerous channels fall into the Bay of Bengal near the false point.

The catchment area of the Mahanadi above Naraj is 51,000 square miles, as big as England and 10,000 square miles bigger than the catchment area of the Tennessee river. The average rainfall in the catchment area is 53.17". The mean annual run-off of the river at Naraj is 74 million acre-feet which is almost five times that of the river Colorado in USA at the site of the Boulder Dam, the highest in the world. This run-off of the Mahanadi at Naraj is 30 times the capacity of the reservoir formed by the Mettur Dam in Madras. The mean annual discharge of the Mahanadi is about one lakh cusecs, which is nearly two-third of the total discharge of all the canals and irrigation wells in India which irrigate some seventy million acres of land each year.

Like all other rivers of the peninsula, the Mahanadi has also reached the base level of erosion, resulting in a very shallow channel full of sand and silt especially in its lower reaches. This channel is incapable of holding the huge volumes of water during monsoon which frequently caused floods in the delta. These floods in the Mahanadi, especially at the delta region, extending over 2,300 sq. miles constituting 70 per cent of the Central Delta, the most fertile and densely populated tract of Orissa, had become a recurring feature.

Further, the ridges between Mahanadi and the neighbouring river systems of Brahmani and Baitarani are low; flood waters of these systems therefore spill into the Mahanadi, aggravating the flood situation in the delta.

The problems of floods in coastal delta has, therefore, naturally received considerable attention from the government. As early as 1858, Sir Arthur Cotton, one of the foremost pioneers of irrigation in India, suggested as a solution, the construction of weirs across the major rivers of Orissa, irrigation canals throughout the delta suitable for navigation and drainage channels between all irrigation channels and embankments. In 1927, a committee of senior engineers appointed by the Government of India went into the question and did not favour the construction of flood control reservoirs on any of the rivers. They were opposed to embankment and suggested that "some of the estuaries should be opened up and cuts made in places through the sand dunes along the sea coast to allow the free passage of flood into sea. The embankments in the semi-protected area should also be removed as they obstructed flow and hence liable to breaches and the Orissa coast canals were to be abandoned as they were serving little purpose for irrigation but were obstacles to the free flow of floods." However, no progress was made in implementing these proposals for want of funds and the opposition of vested interest to the removal of embankments which, though possibly of general benefit to the locality as a whole, prejudicially affected individual interests.

Following the devastating floods of at 1937, Sir M Visvesvaraya was requested by the Government of Orissa to advise them on the flood control problem. Visvesvaraya, who stressed the great need for detailed scientific surveys and continuous observation of the rivers and the delta, visualized flood control by the construction of water reservoirs. He stressed the multipurpose nature of such reservoirs: "If a reservoir is constructed it may prove useful in several other ways as well—for extending irrigation, generating electric power, etc. Once flood comes under effective control, the whole area may be transformed into a prosperous region". In any case, he wished that the matter be fully investigated. "Unless the committee (1928) has based its conclusions on dependable data—which however are not revealed in its report, it seems necessary to investigate this question more fully". He felt that "it is desirable to make some preliminary investigations to see how the question stands at present and whether there is any prospect of its being taken-up later when the province is able to finance such an undertaking". He visited Orissa again in 1939. Although he was in favour of a storage reservoir in the upper reaches of Mahanadi for flood protection, he recognized the difficulties of state boundaries and high costs. At that time, the numerous princely states had not been merged in Orissa and the basin-wide development of the Mahanadi involved the boundaries of a number of such states. The Flood Enquiry Committee in 1940 laid special emphasis on embankments.

The problem was referred to the Government of India in 1945 and was entrusted to the Central Water and Power Commission then known as the Central Waterways, Irrigation and Navigation Committee. That year in the month of May, Mr AN Khosla, the chairman of the CWINC, visited Orissa and after discussion with the authorities felt reservoir dams on the Mahanadi to be the best solution to the problems.

In November 1945, accordingly, in a conference of the representatives of the central government, Orissa, Madhya Pradesh and the feudatory states, a decision was taken for the immediate investigation of the Mahanadi for multipurpose development. In March 1946, the foundation stone of the Hirakud Dam was laid.

The swiftness of the decision to construct such a large multipurpose dam at an enormous cost, was surprising. Indeed, just four months intervened between the date on which the decision to undertake all necessary surveys and investigation was taken and the date on which the foundation stone of the first of the three proposed dams on the Mahanadi, the Hirakud Dam, was laid. Of course the actual construction began in the middle of 1948, which meant an interval of two and a half years between the time of taking the decision about investigation and the actual start of work in the field and a second foundation laying ceremony took place in April 1948.

The first document on the Hirakud project containing the original schemes and estimates relating to the project, came in June 1947. The report said, "It is from the Hirakud Dam only that irrigation can be provided to the areas in Sambalpur district. From this dam alone, it would be possible to afford a substantial and adequate measure of flood protection to the delta at a relatively small cost and at a fairly early date. Power can be developed to the extent of 350,000 kilowatts so that industrial and agricultural development can be planned and proceeded with almost at once. The regulated release of water from the Hirakud reservoir will permit appreciable improvement in the navigability of Mahanadi"

The dam which was to be an earth-cum-concrete and masonry dam was to have a height of RL 625.0 feet, at which the reservoir was expected to submerge an area of 135,000 acres of which nearly 70,000 acres were cultivated land. The main objective behind the storage reservoir was flood control. The report expected that by controlling the flood water of the Mahanadi at Hirakud, which covered two-thirds of the catchment area of the river, and regulating the discharge of water it was possible to keep the flood level at Naraj below the absolute safe limit of 89.00 in the year of normal highest flood. The dam, which was thus to solve to a large extent the flood problem of the delta, was expected to benefit the delta in two ways: firstly, it would save damage to land and property which on a rough valuation has been reckoned at Rs 12 lakhs per year; next, it would make land fit for irrigation and cultivation which at that time could not be so used because of the periodic flooding.

The second objective was irrigation. The report put the gross commanded area in the district of Sambalpur and Bolangir at 13,000 acres and the culturable command area was estimated at 8,75,210 acres. To irrigate this vast area, six main canals and three gravity flow irrigation canals and one lift canal on the right side of the river and one lift and one flow canal on the left, were proposed. The return on irrigation investments were calculated on the basis of water rates then prevailing in the delta. It was also proposed to lease out land in dry season on the shores of the reservoir as water receded. All these taken together however, were not expected to meet the interest at three per cent on capital at charge and the operating expenses of the canal system.

The only paying part of the scheme, according to the project report was generation of electricity. The total capacity of the generators to be installed was put at 3,50,000 kilowatts and it was proposed to generate power at two places, at the main dam and then taking water through a channel up to a subsidiary dam at Chiplima, some 17 miles downstream. The annual gross revenue from electrical power was estimated Rs 252 lakhs and deducting the working expenses the net revenue came to Rs 172.19 lakhs.

Although navigation was not a major objective of this multipurpose project, hopes were raised for it with a certain amount of blasting of the jutting rocks in the riverbed and other conservancy measures. The navigability of the river, as the report expressed, could be improved making it possible for 600 to 800 ton tows to ply from the sea to Dalab (the subsidiary dam) and then via the power-cum-navigation canal through a series of locks to the reservoir and on to the central provinces. All these features of the Hirakud project were estimated to cost Rs 47.81 crores as follows.

Flood Control	:	6.11 crores
Power	:	29.58 crores
Irrigation	:	11.12 crores
Navigation	:	1.00 crores
Total	:	47.81 crores

The project when fully operative was expected annually to yield a net profit of Rs 61.15 lakhs from the 19th year onwards.

The revised report of the Hirakud Dam project of January 1952 showed considerable changes in the original scheme. The total cost of the Project went up from 47.81 crores to Rs 89.00 crores, an increase of nearly 80 per cent. This was not merely due to rise in price and wages but due to many changes in the plan. Estimates changed as the results of detailed investigations became available. In irrigation, instead of six canals as proposed in the Khosla Report, there were to be only three main canals with a gross commanded area of 643,142 acres, which was more than 50 per cent reduction from the 1947 estimates on the basis of which the construction of the dam began, and a culturable command area of 542,00 acres of these three, there was a flow and a lift canal on the right side and only a flow canal on the left. The flow canal on the right was so designed as to make the canal for the power channel redundant while keeping the culturable command area intact. The two mile long lift canal was given up after detailed investigation and instead a 20-mile long lift canal was to be taken out from the main Bargarh Canal that served a gross command area of 108,000 acres or a culturable commanded area of 91,000 acres. From 290,000 acres in the 1947 estimates to a mere 91,000 acres was certainly a big drop. Thus, whereas the 1947 estimates showed a gross commanded area of 1.3 million acres, a culturable command area of 8.7 lakh acres and irrigated area of 1.1 million acres, the revised estimate of 1952 put them at 643,000 acres, 542,000 acres and 791,000 acres respectively.

With regard to the power aspect the size of the generating sets was proposed to be changed. The total installed capacity at the main and the subsidiary dams was reduced from 350,000 kilowatts to 268,000 kilowatts. Besides these changes, there are many technical changes in the design at the dams and the dyke. The raising of the dam level from RL 625 feet to 630 feet meant the submerging of large land area of which about 30,000 acres were cultivated. Now the total cultivated area to be submerged by the waters impounded by the dam stood at a little over one lakh acres as against 70,000 in the earlier report.

After the submission of the revised estimates submitted by the Chief Engineer, Hirakud Project, in January 1952, the Government of India appointed a three-man Advisory Committee to review the estimates, the same month. Consequently, a new cost estimate of Rs 92.08 crores emerged. The main change suggested was in staging the programme of the work, the first stage upto 1960 consisting of irrigation, flood control and development of an installed capacity of 123,000 kilowatts at the power house at the main dam, putting off the subsidiary dam and power house development to a period to 20 years. The Majumdar Committee (the three-man Advisory Committee) generally approved the estimates for irrigation, dam design, canal layout etc. Revised estimates were again prepared on this basis in November 1952, for the first stage only. The final estimates were however prepared and accepted in November 1953. The major change in the estimates, apart from new transmission lines etc, was the proposal to drop the lift irrigation which was prepared on either side of the river and which reduced the culturable command area to 4.48 lakh acres in Sambalpur. The report put the cost for stage I at Rs 70.78 crores. The second stage of the Hirakud Project, as suggested in the report on revised estimates of January 1952, and approved by the Majumdar Committee was to be taken up after 1960. But since there were some

technical difficulties about continuous generation of 54,000 kilowatts at Chipilima, a new generator of 37,500 kilowatts was proposed to be installed at the main dam and the cost of the second stage was finalized at Rs 14.32 crores. The total cost estimate of the Hirakud project, including the second stage came to Rs 100.02 crores.

The main dam

It is located across the Mahanadi below the confluence of the 16 rivers and about nine miles upstream of the town of Sambalpur. Here the Mahanadi river is little over two miles wide and is flanked by two hills. One arm of the dam joins the hill named Chandli Dungri which rises steeply from the riverbed on the right side. The left arm of the dam abuts on the hill Dunguri, which is situated at a small distance from the river bed. The Hirakud Dam comprises a masonry power dam, right and left concrete spillways, with a total length of 3,188 ft and earth section 11,980 feet long. The concrete section of the dam has been built on the right channel and on the rocky portions of the riverbed close to the left bank. One of the earthen section spans the Hirakud and Koliarkud islands between the two spillways and another connects the left concrete dam with the left abutment hill. The power dam is on the right flank of the right spillway.

The main dam is about three miles long, flanked by 13 miles of dykes on the right and left sides. The main dam together with the dykes, with hillocks in-between, forms a 22-mile bund across the Mahanadi draining at the site, 32,200 square miles of the countryside with the maximum flood discharge exceeding a million cusecs. The total length of the earth portion of the main dam is nearly three times that of the concrete and masonry sections. There is a motorable road on the top of the main dam and dykes.

The right dyke is in one stretch a little less than seven miles long. It has an average height of 29.8 feet, the maximum being 43. It starts at a distance about 3.5 miles from the right abutment of the dam and connects the hill on the right of the dam with the Barapahar hill at its other end. The Baragarh Canal with a discharge of 4,800 cusecs, the biggest in the Hirakud Canal system, takes off from this dyke.

An irrigation sluice has been provided in the left dyke, gap two to four, to feed the Sambalpur and Hirakud tributaries.The former is designed for a flow of 120 cusecs and the latter for eight cusecs. The main canal of the left bank, called the Sason canal, takes off from gap four and discharges 630 cusecs.

The magnitude of the construction work in building the masonry, concrete and earth section of the dam dykes expressed in quantity of materials used, are 23 million cft of concrete in cement, 15.2 million cft of hand-placed granite and masonry in cement, 442 million cft of rolled earth fill in the main dam and 198 million cft in the dyke. About four lakh tons of cement and 45,000 tons of steel have been used.

Reservoir

The reservoir formed by the Hirakud Dam extends from the dam site 50 river miles upstream and covers an area of 238 square miles or 184,598 acres, in the two states of Orissa and Madhya Pradesh. The major portion of the area submerged lies in Orissa. Only some small strips of area affecting 34 villages partially along the river Mahanadi and its tributaries were submerged in Madhya Pradesh. In the Sambalpur district, 249 villages have been submerged, 113 fully and the rest partially. Only 43 of the villages submerged were situated on the right side of the river as almost all the area on this side is hilly and covered with reserve forests. The remaining villages were on the left side where the landscape is comparatively flatter and contains long stretches of cultivated fields.

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The gross storage capacity of the reservoir is 6.60 million acre feet of which 1.88 million acre-feet at RL 590 represents the dead storage capacity. The live storage being 4.72 million acre feet the reservoir level during the monsoon period is kept at RL 590 to absorb heavy floods. The reservoir is filled-up to RL 630 by 1st October every year and the discharges of the downstream side is made only through the power units, from October.

Anti-dam agitation

There was a large measure of opposition from the local population as soon as it was decided to proceed with the project. Anti-Hirakud campaign was reinforced by the fact that a large population from Sambalpur district was to be displaced from the reservoir area in order to save the prosperous coastal delta from the ravages of flood. The first announcement by the minister, Mr Radhakrishna Biswas Rai, that the construction of Hirakud dam would save the delta, the most fertile and thickly populated region of Orissa from flood, evoked local reaction as to why people of Sambalpur should suffer for coastal people. So much so that the people demanded evacuation of the people from delta and this provided the basis for a separate Sambalpur state. One of my colleagues who has done an extensive study of the agitation aspect in the light of press reports, rightly remarks: "The flood dimension was subsequently replaced by the development prospective. What emerged as a dominant theme regarding the dam was reshaping of the Orissa economy in production of a modern agriculture through double cropping, industrialization through the generation of electricity and the prospect of navigation". Thus to hoodwink the people, the flood perspective of dam construction was replaced by the development perspective and the dam was presented as a development measure for Sambalpur in particular and the state in general. The inauguration of the dam was done by the then governor of Orissa who stated that the dam had been planned on the model of Tennessee Valley Project of the USA. The same idea was also carried by the central Congress leadership, including Mr Nehru, who had come to inaugurate the construction of the dam work on April 12, 1948. The dam had been presented as a symbol of modernization which could usher in a new era for the Orissa economy. The Congress leadership both at the centre and the state had this thrust to such an extent that the prior examination of the various issues, like problems involved, cost benefit analysis of the project, were suppressed. The state administration started considering these aspects only after a demand by the local leadership for proper examination of facts. Mr Rangaya, ex-chief engineer of Mysore, subsequently released a 26-page report and questioned the logic offered by the engineers on the Hirakud Dam construction. He pointed out the absence of any proper estimate of cost and benefit of the dam construction. Through some rough estimates, he argued that the dam would financially destabilize Orissa's economy. The idea of generating electricity from Hirakud was shown by him to be very expensive as there was no natural waterfall. Alternatively, he suggested the creation of a thermal plant. He viewed the idea of navigation as a doubtful proposition particularly in the context of modern locomotives, and changes in the character of trade and commerce. He also expressed his doubts on the life span of the dam due to the large amount of silt in the river.

The local leadership (including the Congress) and some ex-bureaucrats took an active role in voicing against the construction of the dam. The prominent among them were Mr Bodhram Dube, Mr LN Mishra and Mr Sradhakar Supukar. Immediately after the announcement in the first set of meetings, it was demanded that if the dam was constructed for flood control then the people of flood affected areas should be displaced.

Mr Bharat Nayak, an ex-deputy minister, argued in a public meeting that as such cultivation in Sambalpur was not smooth due to shortage of labour and it would be difficult if dam was constructed, to convert the barren land into cultivable ones. The displacement would create enormous emotional problems for these people in leaving their ancestral

homes. He pointed out that, as far as flood control measures were concerned it would be better if improvement in embankments were given due attention. The issue was also taken up at a meeting in Cuttack. Mr LN Mishra spoke that the dam would result in the loss of fertile land of 310 villages and also loss of minerals. He urged to put the matter for consideration in Gandhiji's darbar. Mr Dube had traced the origin of floods in Orissa dating back to introduction of canals at Cuttack and Puri. The state had to pay an interest of 11 lakhs per annum. With regard to the slogan coined by leaders that the Sambalpur area would develop, Mr Dube pointed out in this connection that the Birla paper mill at Sambalpur, which was considered as a boon for the people, in fact proved otherwise. The people of Sambalpur only got employed as coolies and money flowed outside the state to the industrialists. He estimated that there would be a loss of 15 lakh tonnes of paddy per annum due to the construction of the dam.

A series of public meetings were organized following the inauguration of the dam, under the leadership of the gountias (village headmen) of different villages. About 4000 people demonstrated under the leadership of Mr Dube, Mr Prahaled Railat and others, when the PWD minister visited the dam site. After the first notification served on September 13, 1946 for acquisition of land in 95 villages, strikes were organized in Sambalpur town, and processions and meetings held. On October 10, 1946, people of villages receiving notification came in large numbers to Sambalpur, but for three months no meetings or processions were allowed. In Baragarh and Sadar subdivisions, 144 CrPC was served on leaders like Mr Dube and Mr Purohit, not to hold meetings or attend any meeting for two months. Disobeying the prohibitory order on the same day a strong procession of 30,000 people was organized in Sambalpur, shouting slogans against Hirakud Dam. They demonstrated in front of the then governor of Orissa. In the evening a meeting was presided over by Mr Janardan Pujari and attended by Mr Dube and Mr Supkar. A resolution was adopted to oppose the project work through peaceful agitation, to take steps to separate Sambalpur from Orissa and to demand withdrawal of prohibitory laws.

The demand for separation of Sambalpur from Orissa formed an important basis for organization of the masses against the dam. This also formed a basis for a division in the local leadership and the withdrawal of local Congress leadership from the agitation. With the disapproval of the move by national and state Congress leaderships and Gandhiji, Mr LN Mishra withdrew from the agitation. The state Congress leadership could mobilize the local Congress workers against the agitation characterising the move as a conspiracy by the feudal lords of the garjats. Dr H K Mahatab, the then chief minister, stated that there was an attempt to separate Sambalpur from Orissa and to merge it with Patna, engineered by agents of the Darbar administration. He suspected this to have been masterminded by a few anti-Congress men who were in league with the kings of the garjats. In a meeting he alleged that as gountia system was on the verge of abolition, a few of them are maligning him and his colleagues. He appealed that as a Congressman and as an Indian, Sambalpur should obey the decision of the Congress. He cautioned the people that these conspirators were trying to hoodwink the simple-minded people, and through their design, were trying to appropriate most of the compensation money.

The agitation against the dam finally came to a halt once the construction work was inaugurated on September 12, 1948. The agitation leaders withdrew from the agitation. One of the prominent agitation leaders, Mr Dube, got rehabilitated soon as a government pleader with a salary of Rs 1,000.00. At a subsequent date, the district Congress committee felt that the dam was for the benefit of the people.

Resettlement of the displaced

The problem of resettlement and rehabilitation of the population displaced by the submergence of usually a large area of land under the reservoir was common to all the multipurpose

river valley projects. To repeat, it involved submergence of 249 villages in the Sambalpur district and 34 in Madhya Pradesh — 113 fully and rest partly. The total area of land lost was 182,592 acres of which about 123,000 acres were culturable. It gave rise to uprooting a large number of people from the villages, compensating the loss and finding new homes and new lands for about a lakh of people for resettlement.

A new department under the name of Hirakud Land Organization was set up by the state government for orderly evacuation and resettlement of the displaced persons. Separate offices for land acquisition and land reclamation under the immediate charge of a Deputy Commissioner was set up. Each of the three officers (i) the Land Acquisition Officer (ii) the Settlement Officer (iii) the Land Reclamation Officer, had clearly defined responsibilities. The duty of Land Acquisition Officer was to determine the amount of compensation and make payment to displaced persons for their land, houses, trees, etc. An Additional Land Acquisition Officer dealt with compensation claims for properties acquired for the excavation of the canals. The Land Reclamation Officer assisted by an Executive Engineer was responsible for reclaiming the forest area by mechanical operation. The resettlement staff was responsible for evacuation and receipt of deposit for land and resettlement of people on the reclaimed land.

Payment of compensation

The whole tract of the submerged land lies in the close proximity to the Mahanadi and its tributary, the Ib river. Most of the villages are old habitations where the people have been, for many centuries, improving land for the cultivation of paddy and other crops. Generally, high quality rice is grown which testifies that the land obviously was fertile. The value of the land of this district depended mainly upon its position and fertility. There are five general classes of land such as Bahal, Berna, Barcha, Bari and Mal and each of which is again divided into sub-classes according to its relative fertility or soil factor. Each class of land was allotted a soil factor in the settlement. These soil factors represented the relative fertility and yield of the land. Again each village was allotted a unit rate ranging from 50 to 100 considering the soil condition and situational advantage. Thus each class of land and each village unit had its own market value. The rates of rental were very low compared to those for similar lands in the coastal districts. According to the standing practice, then, the assessment of compensation was done by taking 192 times of the deduced rent. However, the application of such principles to the acquisition of such large acreage of cultivated land would hit the raiyats in view of the great rise in real land value and agricultural prices since the last settlement. The second option, to be fair, was to assess compensation based upon market value of the land. The sale of rayati holding was forbidden under the land laws of the district then. A tenant who wanted to sell his holding had to surrender the same to the gauntia who again leased out to the so-called vendor. The gauntia and the vendor almost invariably entered into a collusive sale and the amount of consideration which actually passed hands was concealed. The mutation records show the facts of surrender and leases, and the land value noted in such cases was also highly underrated. Thus the two main recognized methods of ascertaining the market value of land as stated above do not give correct data for ascertaining the market value of the land. Moreover, according to a rough estimate by the Deputy Commissioner of Sambalpur, who prepared the scheme for compensation for 193 villages, it was found that out of 98,970 acres of land about 27,573 acres were bhogra or sir. Gauntia rayati lands were the proprietory lands under the gauntias. Under the land acquisition rules prevailing then, the vogra or sir lands could be compensated at the rate of market value together with 15 per cent as additional compensation payable under section 32(2) of the Land Acquisition Act. Remaining acres, i.e. 71,397 rayati holdings then, either to be compensated at the market value or at the rate of 192 times the deduced rent of each class of land. At one time, the Deputy Commissioner, being aware of the difficulties in the compensation on the basis of

either rental value or market value, thought of ascertaining the rate of the land on village to village enquiries and examining the people who had personal knowledge of sale of agricultural holding. He sent a team of revenue officers to ascertain the valuation of the land. The following rates were ascertained.

Bahal	1. Rs 600 to 1000 2. Rs 500 to 700
Bame	1. Rs 300 to 500 2. Rs 250 to 350
Mal	1. Rs 200 to 350
Bari	1. Rs 300 to 400
Barcha	1. Rs 400 to 600
Ata	1. Rs 50 to 150

Compensation in the case of Bhogra lands, which were zamindari lands and saleable, had been on the basis of market price. The compensation for rayati land was paid on the basis of multiples of deduced rent. The deduced rent was calculated for each parcel of land after taking into consideration the standard rent, soil factor and village condition. In the case of service land the persons holding it were prevailed upon to take land in exchange in the reclaimed area, the idea being that the village service personnel from the submerged villages may be settled in the new villages. Compensation for wasteland was usually assessed at nominal rate which ranged from one third to one half of the compensation for Ata land.

The valuation of the land on rental basis notwithstanding the fact that vast improvement was made on the land, affected the poor rayats. On the other hand, for the Bhogra lands enjoyed by the gauntias, the market value was decided just by village to village enquiry by revenue officers. It was reported that these petty officials with small bribes could easily be influenced to raise the quantum of compensation. Thus, while the rich peasantry gained from the compensation, the poor rayats lost their lands at a nominal throw-away price. One person was paid a compensation of Rs 94 for five acres of land. There were thousand of cases where people did not have titles to their lands although they had been in possession of their lands for centuries.

The policy adopted in resettlement was to give land for land. Originally it was planned to reclaim 80,000 acres of land for the settlement of people from the submerged area. But in actual experience it was found that most of the people preferred to settle in old established villages rather than taking land in reclaimed area because the reclaimed area was on a hilly slope and near the forest, it was alleged that the area was full of tree stumps and unsuitable for cultivation.

Due to sudden demand for land in the old established villages the local land value increased and this upset seriously the advantage of nominal compensation rates among the displaced persons desirous of purchasing lands in such villages. In many instances they could purchase less land than what they owned in the villages. However it was a matter of free choice with them, i.e., they could purchase land on their own or they could deposit money with resettlement officers and get land from them in the newly reclaimed area. The average rate for acre charged from the land in the reclaimed area was about Rs 200 to 250. It was found from the figures of evaluation in 1954-55 that about 11 per cent of the owners from the submerged area settled on the government reclaimed land and the rest made their own arrangements. From among the people who came to the new settlement colony around 7.5 per cent were either small or marginal farmers who did not have any option but to resettle here. However, one factor which helped to some extent the resettlement of displaced families in the old villages was that the land was available for sale in these villages. The land

legislation enacted in Orissa in 1953 confirmed saleable rights on the occupancy tenants and limited the individual holdings to 33 acres. Therefore, many of the farmers who had no right to sell land acquired this right and sold their surplus land to the people form the submerged area who made cash payments from the compensation money received by them. Land holders possessing more than 33 acres of land were also anxious to sell the surplus land. But in all these cases the compensation amount from the land, building, trees all adding together could fetch only a small parcel of land as the value of purchased land was much higher than the quantum of compensation received.

Although it was communicated to the people of 50 villages to evacuate before April 30, 1955, failing which they would be forcibly displaced, it was noticed that people had not been provided with alternative land although they had deposited money with the resettlement officers and whatever land had been allotted was in resettlement camps which had not reached a cultivable stage. In many villages, compensation for trees, tanks, houses and lands had not been paid. Although it was estimated to disburse compensation worth nine crore and 66 lakh rupees by March 1956, only three crore and 43 lakh rupees were disbursed. There were 11,341 arbitration cases pending. Interestingly, by June 1956 all the people were displaced without compensation, rendering them homeless.

The uprooting of people from the centuries old villages was by no means an easy task. Apart from disturbing their well settled economy and peaceful life, the question of sentiment was involved. The people of the submerged area were very unsophisticated. They had been able to maintain solidarity of the village community organization in tact. The village had its own deity and Bhagabata Ghar, where people gathered to recite the religious discourses. It was unthinkable for them to leave their ancestral villages which also meant leaving their deities. But they knew that there was no alternative but to move in time before everything that they loved—the rich paddy fields, the groves the deities, the tanks and the wells—was submerged.

Resettlement and change after 30 years

Twelve camps were created to accommodate 1,879 households, of which 254 and 625 households belonged to scheduled caste (SC) and schedule tribe (ST) families respectively. The biggest rehabilitated villages in the resettlement colony were Mura and Rampella and the smallest were Phuljhari and Hatibari. Tilgi was deserted because it was situated in a hilly area and unsuitable for human habitation. Nine colonies had predominantly cultivator caste groups and the rest SC/ST households. None of these colonies drew canal water which provided irrigation to 1.69 lakh hectares of area. Water scarcity had become a general feature in the colonies although there were six katas, and the seventh under construction. The reservoirs have dried up. In about seven to eight villages there have been no provision of dugwell and in 10-11 villages tubewells do not exist. So far as educational institutions in the resettlement colonies are concerned, there are two high schools, four middle schools and ten primary schools.

In a survey of 234 households through a random stratified sample, the land ownership pattern, occupation, participation in socio-political process and people's perception of changes, have been gathered in order to understand the range of changes that have occurred after three decades of displacement and rehabilitation. The following table (Table 1) gives the findings of 33 households, who are landless and who work as labourers. Of 201 households, 79 are cultivators and 93 engage in subsistence farming and sell their labour while the rest depend upon cultivation and engage in small business. Ten of these landless households even had land after settling in these camps which they sold later. Seven were earners in their previous villages.

Table 1

OCCUPATION STRUCTURE OF THE DISPLACED

Householdings	Frequency	Cultivation	Cultivation wage-earning	Cultivation business	No cultivation	Previously landless	Did not get government land
Landless	33	—	—	—	33	24	28
1-2 acres	54	4	35	12	3	21	4
2-5 acres	85	36	42	7	—	8	7
5-10 acres	46	30	14	2	—	8	15
10 acres and above	16	9	2	5	—	—	5
Total	234	79	93	26	36	61	19

Table 2

LANDOWNERSHIP POSITION OF THE DISPLACED PERSONS

Land size groups	(N)	Area owned previously	At the time of settlement	At present	% change at over previous village	% change at present over at the time of settlement
0-2	54	98.39	75.01	83.66	-14.97	11.53
2-5	85	346.15	268.01	319.54	-23.16	19.28
5-10	46	231.46	212.93	347.00	- 8.01	62.96
10 and above	16	602.00	162.50	301.03	-73.01	85.25
Total	201	1278.00	718.45	1051.23	-43.91	46.36

Table 3

SOCIAL PERCEPTION AND RELATED VIEWS (N = 234)

1.	Physically assaulted by local inhabitants	5
2.	Oral criticism	89
3.	Matrimonial disturbance	4
4.	Disturbance in social life	47
5.	Helped by local inhabitants	22
	(i) Can say	67
	(ii) Satisfied with social environment	104
	(iii) Dissatisfied with social environment	119
	(iv) Indifferent	1
	(v) Cannot say	10
6.	Consideration of the dam	
	(i) Necessary	50
	(ii) Not necessary	175
	(iii) Cannot say	9
6.1	Economically	
	(i) Better off	92
	(ii) Worse off	131
	(iii) As usual	5
	(iv) Cannot say	6
7.	A. Participation in the anti-dam agitation	
	(i) Yes	200
	(ii) No	13
	(iii) Cannot say	21
	B. Responsibility fixed	
	(i) Government	71
	(ii) Leaders	125
	(iii) Cannot say	38
	C. Dam as beneficial	
	(i) Benefits to them	25
	(ii) Not beneficial	204
	(iii) Cannot say	5

It is noticed that most of the owners are within one acre to the size group of 2-10 acres. Considering the fact that they own small pieces of land which are comparatively newly reclaimed and less fertile, the income generation capacity of these lands can be expected to be much lower than their position in the previous villages. Even if one goes merely by the extent of area owned without any qualification for the quality, one finds a lot of change in their land ownership. As far as changes over their previous villages are concerned, the sample households had a full 44 per cent of their land position at the time of settlement in these camps although it was told that people would lose quality for quantity and the rates of land in the resettlement camps were relatively cheap. The highest fall of land ownership had been registered to the extent of 73 per cent for the big size groups, above 10 acres, with the fall relatively lower for the small and middle groups. In the last 30 years, however, the position seemed to have reversed with the low size groups showing relatively lower expansion of their land area compared to the middle and big size groups.

The income position has increased in 135 households, the increase being more than 100 per cent in case of 60 households. While it has remained more or less same in 45 households, it has declined in 44 households. The rise in the money income in their previous village position however does not indicate a rise in their real income, given the rise in price index at present. One, therefore, notices the income status of the population. In contrast to income, the asset position has declined in case of 88 households and remained identical in 55 households. Eighty five households have registered some improvement in their asset position with only 42 households showing an improvement by 100 per cent or more. A high population was found to have built-up asset position which they were enjoying in their previous villages.

Only 22 households were reported to be local inhabitants around the colony. Of the new inhabitants, 164 households reported to have been satisfied with their new social environment after resettling in the camp, 119 reported deteriorating social relationship, 131 households reported to have been economically worse off compared to their previous villages, 92 reported to be economically better off. The old village form of administration had been replaced by the new Panchayat Raj system. Of 27 persons who reported to have been earlier associated with the village administration, now 21 ceased to function as leaders. The feeling of social insecurity and decline in the economic status was a continuation of their sense of insecurity expressed during the agitation against the construction of the dam. About 200 household heads have reported to have participated in the anti-dam agitation. Of the 196 households who expressed their views as to the responsibility fixed for the construction of the dam, 71 reported that it was imposed by the government. As high as 125 households held leaders to be responsible. In the perception of 101 households, the agitation leader Mr Dubey was responsible for the construction of the dam who, according to them, sold out to the government and coastal people. In their own perception, a meagre 10 per cent of respondents expressed opinion in favour of dam construction and the rest considered the dam to be a disaster.

Ecological problems associated with the Hirakud Dam project are immense, but adequate research work is yet to be undertaken. Mishra and Dash (1984) found that between 1949-75, 45 per cent of the reserved forest around the reservoir was deforested. They particularly record the rapid rate of deforestation during the construction of the dam. The rate of deforestation between 1960 and 1970 was three times as rapid as between 1950 and 1960 and 10 times as between 1970 and 1975. Conducting an analysis of climatic data, they record an increase of mean maximum temperature and a decrease of mean minimum temperature for about 20 years after which an increasing trend is observed. Mean morning relative humidity shows an increase. Rainfall indicated a decreasing trend, the decrease being around 17 per cent and total number of raining days also decreased. Forest loss and changes of climatic factors are correlated with different degrees of acceptable significance. Silting of the Hirakud reservoir is another allied problem of deforestation. Between 1957 and 1976,

the reservoir has lost more than 26 per cent of its water storage capacity. Scientists of the Orissa 26 Remote Sensing Application Centre have studied aerial satellite imageries and have found that within 40 years the reservoir may be silted up to a dangerous extent for which demands from concerned quarters have been recorded to desilt the reservoir. The catchment area of the reservoir from which the run-off water comes to the reservoir, has alarmingly lost the forest cover, causing enormous amount of soil erosion which is yet to be estimated objectively. Steps for wasteland development and prevention of land degradation in the catchment area is far behind the level of satisfication. Drought, flash floods and landslides in various parts of the catchment area, are on record. The small and medium watersheds of the catchment area are mostly filled up with sand causing consequent deluge with slightly above average rainfall. The water impounding bodies (Bandhas, Katas and Muras) in the catchment area have also lost their water holding capacity to a great extent. Numerous springs have died and waterfalls have shrunk due to deforestation. Conscious and concerned people of the catchment area are of the opinion that the catchment area development activities should be taken up on a war footing both in Orissa and Madhya Pradesh. Some of them also propose an apex body like CADA, to be called the Catchment Area Development Authority, to coordinate the activities of governmental and non-governmental agencies.

Environmental problems of the command area are also alarming but scientific studies are yet to be undertaken. Anyone in close interaction with the farmers of this area can see the problems of waterlogging, salinization and alkalinization of cultivated fields. Most of the farmers talk of an increasing fertilizer and pesticide demand. No one has monitored the fertilizer and pesticide use. Pesticide concentrations in drinking water and foodstuff of the area are unknown, but from reports published in other irrigated areas the problem in this area can be well concluded. Prior to canal irrigation, the command area had a number of water bodies for irrigation and community use.

Most of these water bodies are now atrophied and silted due to silt load and growth of submergent floating and emergent hydrophytes. In certain cases, within a short span of 30-40 years, the water bodies have already been transformed to cultivated fields. People remember these water bodies only when canal sluice gates are closed and go on using the thick water without any alternative.

Socio-cultural problems of the command area along with the problems associated with infrastructure and services, also need attention. Biological pest control, safe water supply, fuel crisis, exploitation of farm-yard labour, migration of people from dry areas to the irrigated area, drugs, alcohol, gambling and flesh trade, unemployment and underemployment of traditional village artisans, condition of roads and inadequate facilities of transport and communication, are some of the major problem areas of the region concerned.

Detailed studies on each of the problem areas with concrete suggestions for solution can only bring about a state of perfection in the management of the irrigation and power generation system.

Tehri Dam

SUNIL K ROY

A case study of the environmental impact of the Tehri Dam done by the Working Group set up by the government, provides an insight into the dominance of techno-economic consideration which gives little, if any, weightage to the well-being of local people or the destructive impact on the natural environment. It also highlights the influence of political, financial and technical interests and, evidently, ready acceptance of the presentation of unrealistic cost/benefit assumptions prepared for the sole purpose of obtaining project clearance according to norms established by the Planning Commission. These are apparently being revised in recognition of the crucial relationship between the environment, particularly in the catchment and command areas and the technical validity of the design parameters and cost/benefit calculations. What has yet to emerge is project approval based on a broader-based techno-environmental cum socio-economic approach to the viability of large hydro-electric power projects such as has been attempted for the Tehri Dam, after it had been cleared on economic grounds.

The Tehri Dam is a classic example of the cost-distortions without any change in quantum and quality of the benefits. Submitted to the Planning Commission in 1969 it was cleared in 1972 to cost Rs 197.92 crores for an installed capacity of 600 megawatts (MW). A revised project to install 1000 MW (note actual generation 350 MW) at the revised cost (1983) of Rs 86 has yet to be cleared. The Working Group's 1986 rough estimate of costs at Rs 2000 to Rs 2500 crores excluded the estimated expenses of mitigating the environmental hazards, undertaking extensive catchment area afforestation, mitigating soil erosion and stabilizing the reservoir slopes etc. The foreign policy factors which resulted in handing over the Tehri Dam as a turnkey project to Russian expertise and financing, has more than doubled the installed capacity. It now involves installation of 2000 MW in the Tehri Dam and the construction of the Koteswar Dam downstream with 400 MW. The increased energy potential will more than double and augment the storage of the Tehri reservoir, by pumping Koteswar storage upto it, during off-demand hours. It will not add significantly to the other benefit calculations but will increase pressures on the already degraded environment and reduce off-season flows in the Ganga.

A study of the Tehri Dam takes on additional importance, because it is the first time that a detailed environmental impact-assessment of a large dam has been undertaken officially, as a result of the collective organized protests of local citizens. The latter recognized the dangers to both the human and natural environment locally and in the overall area upstream and downstream of the dam. The examination of the process of Tehri project clearance is revealing. At a meeting, which Shri HN Bahuguna was addressing, he was asked how he had cleared, when chief minister, a project which he was now opposing. He said that he had to examine the voluminous papers prepared by the project authorities, in the early

hours of the morning, when he was not at his best but that this time he had been able to deal with his files. He considered he had to trust his engineers. He acknowledged that he made a mistake and that he was now correcting it. It is ironic that Shri Bahuguna himself persuaded local people to drop their early opposition to the project, assuring them that it would bring many benefits. Socio-political aspects linked with clear signs of damage due to the project and road building, with later availability of the Tehri Dam Project report, augmented the fears of local citizens. They presented a petition to Parliament. A Parliamentary Committee of Enquiry was established but was unable to submit its report before the Janata Government, then in power, was replaced by the Congress. However, following continued representations, the late Prime Minister, Mrs Indira Gandhi, ordered the establishment of a Working Group for the Environmental Appraisal of Tehri Dam in December 1979.

"The Working Group was required to study the impact of the TDP on the environment and to submit its report by 31st March, 1980, but no meeting could be held until the end of February 1980 because of the non-availability of Shri SK Seth, the chairman nominated at the time of constituting the Working Group in December 1979 and his replacement by the present chairman, Shri SK Roy in mid-February 1980." (Interim Report para 1.3). It was unable to fix a final date for completion of its final report "because the environmental conditions had changed considerably in the last 15-20 years and all the required information was not available". (Interim Report para 2.2). It, therefore, submitted an Interim Report on 31st May, 1980 to collect essential data identified during its meetings and to ensure immediate action to prevent further deterioration of the environment in the project area.

Terms of reference

"The Working Group was conscious from the outset that its terms of reference required it to report only on the environmental impact of the TDP. From the initial discussions and examination of the project report, it became clear that this required consideration of a linked factor, the impact of the environment on the TDP. During the course of discussions, at a series of meetings, and specially during the site visit, this aspect received vivid visual confirmation. The Working Group also had to recognize the environmental impact on the human problems arising out of the uprooting of thousands of people from their traditional homes and their resettlement in an unfamiliar and, at present, difficult environment". (IR para 1.4).

The Working Group noted the weakness in creating public confidence in the project and the absence of efforts to respond to local aspirations through developing training programmes for people in the area and those being ousted from their homes. It also found it necessary to record its confidence in the technical capacity of the engineers because of the local hostility to them shown at the 21st April, 1980 public meeting in Tehri town adding: "In the light of the possible fallibility of any technological investigation and the grave doubts emphatically raised by opponents of the dam, it is essential to re-examine, in even greater detail, all possible environmental aspects. Indeed, as was explained at the Tehri public meeting, no responsible government would dream of taking any risk in a matter of such overwhelming and over-riding importance. The humanitarian and cultural aspects of the environmental impact must also, in a society dedicated to the overall welfare of the people, be given much greater attention than hitherto." (IR para 3.1).

The Interim Report specified areas of concern where additional scientific data was essential. These are listed seriatim, with comments on the position, when the Working Group finalized its report:

Geology

(a) The major riverbed shear zone—its presence was disproved by later geological investigations.

(b) The Marh fault exposed 4 km downstream of the dam and inferred to lie at 7.5 km below the dam site—the required study by the National Geophysical Research Institute (NGRI) to establish "a more precise location" and "whether it was seismically active" has NOT been done, as the experts insisted it was of no importance.

Seismicity

Noting the existence of four seismological observatories and that observations with mobile instruments indicated very minor seismic activity near Tehri, the Working Group considered that the "data so far collected is inadequate". It required monitoring "at more numerous locations" and "of the faults lying within a radius of 100 km of the Tehri Dam". For various technical reasons this has not been done but suitable instruments are now available.

Reservoir Induced Seismicity (RIS)

The report related its recognition that "it looks probable that the seismicity level may not be enhanced by the construction of the Tehri Dam in the absence of increase in seismicity in other large dams in the Himalaya. It also noted that in only 15 out of 425 large dams has seismicity increased due to reservoir filling (Later data—Dr Harish Gupta—revealed that the Tehri Dam's 260 metres height is relevant because six out of 20 reservoirs between 150 m and 250 m i.e. 30 per cent, witnessed RIS). The report required continued seismic monitoring" to build up a statistical data base and to take appropriate control measures as may be required anytime in the future — this has not been done.

Geomorphology

The Working Group considered essential "a detailed geomorphological map of the catchment". This was done by the Wadia Institute but only of the reservoir area. The studies covered, only partially, those areas listed in the report and given below.

1. Geomorphic studies:

(a) Prepare geomorphic map on 1:50,000 scale to identify different types of land forms existing in the area.

(b) Conduct drainage basin analysis to know of the behaviour of channel network with the fluvial processes.

(c) Present status of soil erosion in the catchment.

(d) Slope analysis for stability characteristics — rim of lake and the catchment.

2. Landslide mapping:

(a) Genetic study of landslides.

(b) Identification of active and inactive landslides.

(c) Landslide zonation.

3. **Land System:**

Land system mapping on 1:20,000 scale.

4. **Micro-climatic studies** (IR para 3.5.1 to 4)

Cultural and humanitarian

The Interim Report drew attention to the traditional, emotional and religious importance of the Bhagirathi and the Ganga pointing out that this "needs very serious consideration and very tactful handling". It observed that the conditions in the resettlement areas, Bhaniwala and Johra, were far from satisfactory, observing that "the humanitarian aspect takes on a predominance today" — only peripheral notice was taken.

Flora and fauna

In view of the depletion of wildlife and conditions in the catchment, the Interim Report considered it essential to declare a significant portion of the catchment area as a National Reserve—no action was taken.

Catchment area

During the site visit, the Working Group observed: "There was disturbing evidence of what can best be described as an endangered catchment area. Overgrazing and deforestation and land use practices requiring maximization of the cultivable land even on some precipitious hillsides, have created lasting crisis-conditions. The obviously unstable hillsides, the landslides visible at all points of road building activity, and the blockage of the Bhagirathi at Kanaudia area was indicative of future danger". (IR 3.6). It recommended the measures listed below to be co-ordinated through a "Catchment Area Development Authority" and through "a new kind of organization, Conservation Corps"—reportedly in 1986, the first was created under the Commissioner (Garhwal) but nothing was done about the second measure.

Siltation

At its very first meeting the Working Group asked for "fresh studies of the siltation levels" and that this be done at "a number of measuring stations in the river, upstream of the proposed dam site, including its tributaries, where measurements have to be taken of the silt load suspended and bed, especially in the months from June to October"—was deliberately ignored despite data which shows all siltation estimates have been far below actual levels.

(a) Soil and water conservation, land use planning and flood control works should be done on a watershed basis:—no action taken.

(b) The flood control programme should be a combination of soil and water conservation in the upper reaches of rivers and streams;

(c) Afforestation and soil conservation must be ensured:—almost nothing done.

(d) If any forest area is submerged or required for resettlement, equal forest area must be afforested:—no action yet, but areas reportedly identified.

(e) The management of village common lands and the so-called wasteland should stress growing of fuel, fruit and fodder trees and grass. At present these areas do not give any economic return but are a source of sediment and floods:—nothing done.

(f) There should be provision for soil and water conservation measures in the project so that the large resources provided are utilized effectively:—financial resources being allocated.

(g) Roadside landslips and landslides and other slip-zones must be stabilized:—considerable stabilization done at the dam site but nothing in the other areas.

(h) Banning all commercial forestry in the catchment:—not done.

Afforestation

The Interim Report emphasized the need for "Conservation Forestry" with efforts to "augment natural regeneration" and "to prevent damage from fire and overgrazing". It also suggested the introduction of fuel fodder and fruit-bearing trees as a means of ensuring local co-operation—but nothing was done.

Command area

The Working Group noted the absence of command area data, some of which was provided but "information on malaria control and health services" has not been given.

General

Anticipating the pressure on local resource by the large labour force, the Working Group recommended measures to minimize local hardship. These included organization of essential supplies, provision of fuel and examination of innovative solutions, such as setting up an "electricity-based community kitchen, an experimental stall-fed animal husbandry operation, making Tehri new town a model town; controlling road building in the catchment area and using alternative transport modes like ropeway haulage. Nothing worthy of consideration was done except for some belated measures for fuel supply to labour.

Final environmental appraisal report

The Tehri Dam environmental appraisal, after more than six years' work, is a compromise document and not an effective EIA because of the substantive difference in approach, between the technically interested members, and the environmentally oriented members. In addition, much of the essential data needed for a meaningful assessment was not available in mid-1986 though requirements were detailed in the Interim Report, as shown in the preceding paragraphs, submitted to the government on 31st May, 1980. Despite this, the final recommendations in the report show the Working Group considered that the Tehri Dam, with an installed capacity of 1000 MW, had environmental implications "not commensurate with the potential benefits" and therefore a series of run of the river schemes should be seriously considered". They also raised some basic questions about the need to ensure "maximum long term benefits to the local people" through projects which do not have adverse socio-economic consequences and damage the "already degraded environment".

Development objectives

What emerges challenges the main purpose of planning in India, which holds that such projects should contribute to the general uplift of the common people. Though contributing to food surpluses and adding hydro-power, the negative impact on the economically-deprived sections by such large projects is well documented. Many villagers upstream have either been

ousted or partially deprived of their lands and landless labour ousted from their homes are not even compensated. The economic condition of those who remain worsens, except for a minority. Downstream villages, once sure of abundant water from rivers find alternate flood and famine in water supply. In the Tehri area, hill villages which once had springs, now face acute water shortages. Reservoir water resources and energy generated go to urban centres, industry and richer farmers. Delhi already receives 200 cubic metres per second from the Ramganga dam and is scheduled to receive 300 cubic metres per second from Tehri. The resettlement areas are still as unsatisfactory as they were when visited in 1980 and the resettlement plan still unformulated. Except that we continue to apply precolonial feudal norms, there would be a crescendo of public protest at what the report records as, in effect, an infringement of "the constitutional and fundamental rights of the affected people."

Cost-benefit and design considerations

There are 1,554 large dams listed as under construction or completed. None has met the original completion schedule. All have exceeded the cost estimates very substantially and none has achieved the calculated benefits. The poor data-base and tendency to overlook inconvenient studies and to discount contrary views has evidently contributed to many distortions. This may also cause severe problems in both the short and long term. Drought for successive years in Gujarat, Maharashtra and other states with more than doubling of the flood-prone area in a decade indicates the limitations and provides evidence of dependence on incalculable climatic variations and damage to the natural environment. For instance, of the large dams listed, 276 are in Gujarat and 631 in Maharashtra where the incidence of drought has steadily increased and forest cover has been severely depleted.

The structural design of the Tehri Dam is based on the expectation of the maximum credible earthquake (MCE) once in the life of the dam. However the seismic co-efficients for the design vary from 0.15 g (Standard Committee for Evaluation of Seismic Co-efficients for River Valley Projects) through 0.25 g (used in the design by the Department of Earthquake Engineering, Roorkee University) to 0.56 g (calculated by the NGRI). All three used a different base, but all lack in-depth seismic data (recommended by the Working Group in 1980). Therefore 0.25 g may mean excessive cost through over design, while 0.56 g may mean economy at the expense of safety.

The Himalayan rivers are snow-fed. Although the first of the large dams, Bhakra, receives only 16 per cent of its flow from catchment rainfall, no in-depth glacierological study is available. Whatever flow data is collected is not for public distribution for security reasons, but there is ample evidence to show that it is able to contribute little to effective water management. Gujarat is again an example. In 1986 about 150 dams had to release flood waters while about 120 lacked enough. In 1987 most dams have almost no water and others barely enough for essential supplies. Though this fluctuation is a general feature for most dams, it is aggravated in Gujarat where total or near-total lack of continuous monsoon flow in rivers with dams, inhibits natural recharge of ground water acquifers. This has lowered the water table, led to drying up of wells and water salination, adding to drought hardship.

The environment and development

In the six years since the submission of the Tehri Dam Interim Report very little, if anything, has been done to respond effectively to the human and environmental aspects in development planning. The emphasis has remained on technological infallibility, and the conviction that environmental considerations have to give way to the thrust for development. There is increasing realization that environmental conservation is an essential component for sustainable development. The changing policy approach has to strike a balance, as prosperity in the

short term with a degraded environment becomes counter productive. An integrated examination of dams linking the environmental appraisal of the Tehri Dam and the implications of the Russian turn-key project, which more than doubles the installed capacity of the whole project to the overall plans, hampers the immense energy potential of the Himalayan rivers.

Since Independence more than 200 projects involving large multi-purpose dams have been examined. Accurate statistics are not readily available but apparently 23 have been finalized, some completed and the rest under construction. With the exception of the Tehri Dam, there has been no examination of the impact of the Himalayan ecology of the various hydro-electric power and other development projects, including staff accommodation construction, road building, etc. Such a monumental interference with the natural systems has caused many grave problems in the Himalayas and on the Gangetic plain. In all cases, including the Tehri Dam, the projects have been examined in isolation without any effort to consider the consequences or the accumulated environmental impact of so many major projects. Any meaningful assessment has to examine, in detail, the cumulative de-stablizing potential of multiplicity of dams and the large number of other environmentally disruptive projects, the over-exploitation of the forests in the catchment areas and the silt and flow contribution of the glacial areas. The known unstability of the Himalayan slopes in a highly active seismic zone has been seen only in relation to the design parameters of the dams. No meaningful weightage has been given to the known prevalence of landslides, the extensive deforestation and soil erosion and the heavy silt and bed load in all the Himalayan rivers.

Irrigation and hydro-electric power engineers are wedded to the building of dams as the most cost effective means of increasing food production and of generating hydro-electric power. Until recently, this was thought to be more economical and less damaging to the environment than other means of producing much-needed energy. Neither premise is accepted any longer. The evidence obtained from indepth studies of the numerous large dams built all over the world has shown that cost-benefit calculations have been tailored to meet planning parameters for clearance and that there is considerable damage to the natural and human environment. The latter has not been taken into consideration when calculating costs. The multiplicity of negative environment impact in general and on individual projects has forced a totally different evaluation. It is now recognized that dams are a high-cost, slow-gestation approach to energy generation. They constitute a major interruption of the natural flow of river, resulting in substantial modification of the ecosystem and alternation of the hydrology upstream and downstream of the dam site.This has been highlighted by the prestigious Washington-based World Resources Institute study on major public financed irrigation systems. It points out that "large irrigation systems have extensive environmental impacts, displacing whole communities, flooding valuable forest and agricultural lands, and threatening critical ecosystems".

The British technical journal "Water Power and Dams" makes a similar indictment that "large-scale water projects have also provided the infrastructure for introducing new forms and scales of production in Third World countries. They have also been, however, a source of significant environmental change, unexpected harmful disease, the impoverishment of aquatic fauna and decrease of water quality. Furthermore, the resettlement of local people has seriously affected their cultural patterns and lifestyles. In the last 20 years, more than 500,000 people have been resettled, just for the dams financed by the World Bank. These social and environmental costs have very often outweighed the benefits of water projects and could explain the early interest in adopting an EIA (Environmental Impact Assessment) for evaluating this kind of project."

Even in purely techno-economic terms without considering human and environment factors, it is becoming clear that costs are seriously under-estimated and benefits grossly exaggerated in order to arrive at the cost-benefit ratio required for clearance. Mere feasibility

and the assumed costs and benefits have now to be examined in relation to the environmental impact, which affects the project itself, and results in the social, cultural and economic dislocation of the communities uprooted and those remaining in the area, following the substantive changes caused by the project on completion as well as during the construction period.

No detailed analysis has been done of the extensive overall augmentation of costs but the immense shortfall in benefits is well established. The Planning Commission has recorded that the production of irrigated lands is about 1.7 tons per hectare against the expectation of four to five tons per hectare. On a broader base the Prime Minister stated the failure of such projects to provide benefits to the people in a statement at the State Irrigation Ministers' Conference:

> "The situation today is that since 1951, 246 big surface irrigation projects have been initiated. Only 65 out of these have been completed; 181 are still under construction. We need some definite thrust from the projects that we started after 1970. Perhaps we can safely say about these projects that for 16 years we have poured money out. The people have got nothing back, no irrigation, no water, no increase in production, no help in their daily life. By pouring money out to a few contractors or a few thekedars and labourers to build canals and may be Public Works Departments to construct the dam, we are not really doing our people a favour. The favour comes when the project is completed, when the benefits of the project start flowing".

The tendency to assess cost-benefit ratios so that the resultant figure meets the planning requirements, is common to all countries. This general position was assumed by President Carter before he became president:

> "In many Corps of Engineers, dam projects around the nation, the benefit-cost ratios have been grossly distorted. Data and premises on which project approvals are sought are erroneous and outdated". On the Sprewell Buff Project, "construction costs were under-estimated, extremely low interest-rates were assumed, nearby lakes were ignored, population projections were exaggerated, environmental damage was concealed, power production estimates were based on overloaded generator rating...."

Independent observers in India and elsewhere have noted that the statistical approach to cost-benefit analyses has invariably been presented to meet the required parameters to ensure project clearance. In India one can safely assert that no major or medium hydro-project has met, even approximately, the original cost estimates. Also, every project, however beneficial, has failed to provide the targeted benefits. What is really conspicuous is the gap between the irrigation potential of 20.8 million hectares (mha) created at the cost of Rs 15,206 crores between 1951 and 1985 and the 15.6 mha actually utilized. The creation today of the 5.2 mha unutilized would cost an additional Rs 15,000 crores. In addition, at least seven mha of productive land has been salinized, some 22 mha of the catchments of major projects are critically eroded of which only two mha have been treated and irrigation projects have been causing losses around Rs 800 crores per year. (BB Vohra)

Humanitarian aspects

The costs have almost totally ignored the human tragedy though some nominal attention has been given to rehabilitation. In practice there is no record of a single successful programme to resettle the oustees. Those uprooted due to the Bhakra Dam made little or no use of the official relocation offers. Except for those who resettled themselves in the catchment area, the uprooted have added to the urban and rural poor. Because each project has been viewed in isolation there is no overall estimate of the total oustees from the 1554 large dams in India. At a rough estimate the total is between six and a half to seven million

souls, most of whom are from the economically deprived tribal and forest-dwelling sections, with no means of questioning the arbitrary aquisition of the areas that they have occupied from earliest times. It should be evident but is not "that the economic benefits of the water resource development should be conferred as much on the people uprooted and living in the lake basin and catchment area as in the command area and in cities with their industries in the plains". (Valdiya)

The reality goes so very much deeper emotionally. People, wherever they are in the world, have a deep rooted attachment to the place of their origin, and Indians conspicuously so. How much stronger this is for rural people needs little emphasis! This sense of loss is movingly expressed by an American, a Cherokee Indian, speaking about the inundation by the TVA Tellico Dam of a homeland from which his people had been moved a century earlier during the infamous "Trial of Tears": "We cannot separate our place on the earth from our lives on the earth nor from our vision and our meaning as a people. We are taught from childhood that the animals and even the trees and plants that we share a place with, are our brothers and sisters. So, when we speak of land, we are not speaking of property, territory, or even a piece of ground upon which our houses sit and our crops are sown. We are speaking of something truly sacred. Is there a people anywhere in the world that does not revere its homeland? Is there a human being who does not revere his homeland, even if he may not return?"

Health hazards

Dr Ramalingaswami in his paper on "Human Ecology and Health" evaluating the role of river-basin development on the increasing incidence of diseases such as malaria, filariasis and Japanese encephalitis communicated by insect vectors says: "We are at the cross-roads today with regard to our ability to control these diseases. They are endangering public health, productivity and national development". He adds: "Water impoundments will increase favourable vector sites at times of the year when they were previously scanty. Water is essential for the development of mosquitoes. They transit a number of tropical diseases. A majority holds that: "real economic returns from water resource development projects may be seriously compromised by enhanced disease transmission of vector-borne diseases. The states of Punjab and Haryana have now become endemic for malaria on account of these factors, as also the Raichur district of Kamataka state after Tungabhadra damming and Canal network development".

The Working Group held its first meeting on 3rd March, 1980. It submitted an 'Interim Report' to government on 31st May, 1980, because of the virtual absence of essential information on the environmental aspects needed for a data-based analysis of the environment impact. Though still faced with inadequate data, the Working Group submitted its final report in August 1986. The unfortunate delay was partially due to data inadequacies but also because, for the first time, a detailed study based on a holistic approach was made (holism is best defined as a "Tendency in nature to form, wholes that are more than the sum of the parts") of the environmental impact of a major project.

Parameters

The Working Group at no stage questioned the capacity of the engineers to design a structurally secure dam to withstand an earthquake of intensity 8.5 (Richter Scale). The entire approach concentrated on the environmental implications of constructing a large dam, high in the extremely unstable Himalaya and the degradation and deforestation of the major part of the catchment in the Bhagirathi valley, subjected to extensive exploitation from very early times. The inundation of a major part of the most fertile lands in the area and the arbitrary uprooting of those in the submerged area and the dislocation in the pattern of life of

those remaining introduced a crucial humanitarian element. It also recognized that it should not consider the Tehri Dam in isolation without relating it to the impact on the Himalayan ecology of all the other development activities in the region. This was spelt out in a high level meeting chaired by the Secretary (Environment): "Even if the projects individually are rather harmless, a series of such projects would result in cumulative environmental impact of an order that may be unacceptable. Therefore, it is imperative to treat the river basin as a whole or as one planning unit". The UP authorities were required to prepare a detailed report of all development activities with an assessment of their environmental impact. No reports were received except some peripheral background on the water resources projects.

A recurring attitude which emerged during discussions was the tendency of the engineers to see dams only as engineering structures to moderate and utilize the flow of rivers for development. There was little concern and less understanding about the environmental aspects and the tragic uprooting and dislocation of the local populations, despite periodic assertions to the contrary. Until finally over-ruled, the Chief Engineer of Tehri Dam had such little comprehension that he insisted that the impact on the Command Area and downstream was outside the Working Group's terms of reference. Right upto the final meetings, after six years, the engineers had no knowledge of the change in water quality Ph&BDD levels etc. or even of the danger of weed growth in the reservoir. That there could be a cumulative negative impact in many areas including the Gangetic plain was not recognized. This is surprising because several former chairmen of the Central Water Power Commission have recorded papers showing profound insight into all such aspects. The most recent is Dr. VK Murthy:

> "The programme for the creation of a large number of man-made lakes is likely to have a profound impact on the environment of the entire region. It is prudent to have a close look at the type of problems which are likely to arise and assess the possible adverse effects, which the development of the water resources of the region may generate, so that these can be taken care of at the planning stage, and effective advance action can be taken to mitigate economic loss and human suffering".

Himalayan ecology

This view runs concurrently with the larger issue of the need for environmentally sound development for all development projects in the Himalayas, and indeed elsewhere. In a 1975 paper a distinguished scientist, former Secretary, Agriculture and Adviser, Planning Commission, Dr MS Swaminathan outlined the symbiotic relationship between the condition of the Himalayan ecology and the future well-being of the Indian people:

> "The adverse consequences of indiscriminate deforestation and shifting cultivation are now manifesting themselves in numerous ways like flash-floods, landslides, soil erosion, silting of canals and reservoirs... The damage to the Himalayan ecosystem through extensive deforestation and landslides promoted by the methods adopted for the construction of roads, mining etc., has become a matter of global concern. If we do not arrest and reverse this process before the end of this century, the entire future of Indo-Gangetic agriculture may be in danger. Since the Indo-Gangetic belt has the maximum untapped agricultural production reservoir in the country, our ability to feed 1000 million in another 25 years is inextricably linked with the restoration of the Himalayan ecosystem".

The Working Group emphasized that the sacred and mythological significance of the Bhagirathi and its identification with the continuity of Indian culture and civilization is a very significant element. It is related to deeply held emotional and religous values and traditional

behaviour patterns, current over millennia. The inundation of Tehri town wipes out a pilgrim centre with two annual melas. The site itself allegedly lies in the Puranic Ganesh Prayag Kshetra. Some claim that the Ganesh temple at the confluence of Bhagirathi and Bhilanganga is described in Kedar Khand Puran.

Despite the planners' comparative indifference, the area does have special importance for the people quite apart from generational associations over several centuries. The Working Group, therefore, recorded its view that the arbitrary ousting and simultaneous dislocation of the life of the local people remaining in the area, the inundation of most of the richest agricultural land in the area and the cutting off of villages on the opposite banks of the Bhagirathi and Bhilanganga rivers will cause great hardship. This, as the report specified, infringes on the constitutional and fundamental human rights of the affected people.

Environmental issues

As shown at the outset, almost nothing has been done to implement recommendations in the Interim Report on non-technical areas of environmental concern such as effective afforestation of the catchment area, soil conservation measures, initiating local development and training for the well-being of resident communities and developing an effective Public Relations programme to create greater public confidence in the project. This is also the case for environmentally significant technical matters like the refusal to undertake and include in their calculations multiple point siltation measurements upstream of the dam site, failure to increase the data on seismicity from additional locations, monitoring of seismic activity of faults within 100 kilometres of the Tehri Dam, collection and analysis of gravity and magnetic data on the prominent lineament passing near Hardwar and ignoring the requirement that the environmental impact had to be integrated with consideration of the environmental implication of all development programmes in the area. Except for proforma details on water resources development projects, there has been no response.

Siltation

Detailed measurement of the silt load have been done from only one point close to the dam site despite the WG's requirement that there should be many more measuring points. The failure to do so adds to existing inadequacy. The original project report cleared in 1972 by the CWC estimated a silt load of 8.2 ham per 100 sq km per year. The adjusted rate accepted now by the CWC is 13.49 ham per 100 sq km per year based on observations over eight years but deliberately excluding the 1978 figures on the grounds they were exceptionally high. The project report itself states that the "data is inadequate for any statistical analysis, since no better data is available for arriving at a rough assessment". Significantly the silt load would rise to 16.53 ham per 100 sq km per year by including data for 1978.

The same report also records: "However, even with the high rate of siltation of 13.5 ham per 100 sq km per year as worked out, the useful life of reservoir works out to be quite long. On this basis, the live storage capacity of Tehri Dam worked out to 100 per cent at the end of 25 years, about 97per cent at the end of 50 years, about 93 per cent at the end of the 75 years, and 88 per cent at the end of 100 years". There are other dubious elements in these calculations in addition to the change if the 16.15 ham per 100 sq km per year is applied.

The TDP has related the observed silt load of six ham per 100 sq km of catchment area per year observed in Bhakra Dam based on 22 year data from 1959 to 1981 and the assessed value of 8.2 ham per 100 sq km of catchment area per year as per world-enveloping curves of Joglekar, to its acceptance of the adopted siltation rate of 13.97 ham per 100 sq km of catchment area per year for Tehri Dam. Convenience provides the only basis for a comparison of the Tehri Dam with either Bhakra or the Ramganga. Both are almost in the plains and the

sides of the Bhagirathi are nine times steeper. What requires serious consideration is the observation in the Report of the Planning Commission Task Force on the Study of the Eco-Development of the Himalayan Region. "In 21 case studies, the siltation rate has increased by 182 per cent. The life of the Ramganga Project, originally estimated at 150 years, is expected to be reduced to 45 years. No authentic measurement of siltation loads in the main river basins appear to have been made so far, but the evidence cited above shows how grave the problem has become in the last few years."

Figures from the Irrigation Commission Report are illustrative of the serious gap between estimated and actual rates. Conditions have already deteriorated further through deforestation, over-grazing and cultivation of steep slopes.

Annual rates of siltation in selected reservoirs (in acre ft)

Reservoir	Assumed Rate	Observed Rate
Bhakra	23,000	33,475
Naithon	684	5,980
Navurakshi	538	2,000
Nizamsagar	530	8,725
Panchet	1,982	9,553
Ramganga	1,089	4,366
Tungabhadra	9,796	41,058
Ukai	7,448	21,758

The project report also makes a comparison with figures quoted by Carl Brown of the US Department of Agriculture, based on the condition of the reservoir catchment of US rivers, drawing the conclusion on the 100-year expected life of the Tehri Dam. There is no meaningful basis for this comparison because there is a vast difference in the rate of soil erosion between US and Indian rivers. According to figures presented some years ago by Shri HN Bahuguna, then Minister of Irrigation, the rates of soil erosion in acre ft per 100 sq miles per annum are shown below:

India		USA	
Sutlej	150 acre ft	Columbia	1 acre ft
Beas	400 acre ft	Mississipi	6 acre ft
Ravi	400 acre ft	Tennessee	12 acre ft
Yamuna	400 acre ft	Colorado	36 acre ft
Kosi	500 acre ft	Rio Grande	61 acre ft

Seismicity and reservoir induced seismicity

The TD and their earthquake engineering consultants are confident that even major earthquakes of 8.5 in the Richter scale will not do any damage to the Tehri Dam or result in any significant impact on the reservoir rim which could threaten the safety of local or downstream communities. They, in consultation with the Geological Survey of India (GSI) are also definite that they have taken into consideration all the reported faults in the vicinity of the dam, including the Marh fault alleged to lie below the site. This is predominantly theoretical as in-depth intensive field studies have not been done, not even for the Marh fault. The wide range of seismic studies required by the Working Group have also not been done. The very

limited scientific data on which the conclusions are based adds to concern because the Wadia Institute geomorphological study considers inter alia that there is a "geomorphic imprint of tectonic activity in all three units i.e. the reportedly inactive Srinagar Thrust, the Pratapnagar Thrust and the Dharasu Thrust in the Tehri Dam area. The first "passes through the reservoir in its middle in both the Bhagirathi and the Bhilanganga valleys" whereas the Pratapnagar "runs across the reservoir in close proximity to the Srinagar Thrust in the Bhilanganga valley".

A GSI statement reflects the reality: "The determination of seismic status of any fault as a capable fault is always subject to alternative interpretation and healthy scientific controversy will continue indefinitely on the subject." (Page 8 para 2.1.4). Just how "healthy" such controversy would be for downstream communities, Rishikesh, Hardwar and beyond if there is any kind of catastrophe as envisaged by some members and the NGRI report as a clear possibility, can be well-imagined. A classic much quoted example is that of the environmental impact which wiped out the entire community below 850 ft high Vaiont Dam in Italy. Geologists and the engineers are still blaming each other for an event which killed more than 2000 people and washed away their homes. Incidentally, the Italian authorities have allegedly not published the final report. This case was mentioned in several meetings of the Working Group. At the concluding session the CWC representative even mentioned that such a situation is now taken into consideration by it in its examination of projects. Yet, it does not find a place, in the Report, entirely because of strong objections of TDP authorities.

The Wadia Institute's conclusions and the likelihood of Reservoir Induced Seismicity are strongly disputed though as indicated there is no data from detailed observations. The NGRI report's remarks "on the steep northward dipping Srinagar Thrust which passes within six km of the dam site" adds weight to the WI view that further study is required. There is no agreement among geologists regarding the current activity on this thrust "mainly because no attempts have yet been made to look for coherent geological evidence of recent activity". Further, "significant clues ... can be obtained from painstaking study and dating of the structural features" ... concluding that "whilst a knowledge of present seismic activity of this lineament may not seriously affect the probability estimate of a major earthquake occurring in the region, it would add a significant dimension to the risk assessment by providing information regarding their role as focusing lenses to shape energy directivity in the region. An active fault trace near the dam, for instance, would focus an unusually high energy density in its vicinity"—National Geophysical Research Institute (NGRI). The NGRI report on Earthquake Risk to the Tehri Dam states, "A significant observation worthy of note is the gap in seismicity immediately east of the rupture zone of the 1905 Kangra earthquake that extends for over 700 km to that of the 1954 Bihar earthquake. This is long enough to require ruptures by at least three major earthquakes (M = 8.0) from west to east, to release the strain that may have accumulated at the edges"

Since a large number of dams are under construction and more are in the planning stage, an additional element is Reservoir Induced Seismicity (RIS). Harsh Gupta (Centre for Earth Science Studies) in his paper on 'Seismicity in the Vicinity of Dams on Himalayan Rivers and the Problem of Reservoir Induced Earthquakes' states: "As demonstrated earlier the thrust fault environment, generally prevalent in the Himalayan foothills, is not conducive for RIS. Special investigation carried out at some of the reservoir sites has shown reduction of seismicity consequent to reservoir impoundment. For example, Jacob et al (1979) reported a marked reduction in seismicity following the impounding of Tarbela Reservoir in Pakistan. Investigations carried out in the vicinity of a number of other reservoir sites, such as Bhakra, Mangla, Pandoh, Pong etc. have also not indicated RIS. It may, however, be noted that normal faults, oblique to the Himalayan frontal have been inferred by some investigators. Large reservoirs in the vicinity of these faults could induce earthquakes"

"It is absolutely essential to carry out extensive seismic surveillance in the vicinity of large reservoirs at the planning stage. Worldwide statistics have confirmed positive correl-

tion between height of the water column in the reservoirs with heights between 150 and 250 metres. Of these, 30 per cent have witnessed RIS. Whereas for reservoirs having heights between 90 and 120 metres, RIS has been observed in only six per cent cases. Therefore, the alternative of small hydro-electric project should be very seriously considered." This view has significant relevance for the Himalayas as a number of high dams are in the vicinity of the type of faults indicated, and according to the Chief Engineer, Tehri Dam is in the vicinity of the epicentre of the Kangra earthquake which reportedly had the highest intensity ever.

A UNESCO Working Group on Seismic Phenomena Associated with Large Reservoirs unanimously agreed to the following statements at its first and second meetings. "During the past few years, the impounding of certain reservoirs has been found to be responsible for triggering seismic phenomena, irrespective of the seismicity of the region. Characteristic examples are associated not only with recent tectonics and high seismicity but also with older and more stable masses of very early tectonics". Up to the present time, a small number of these events, some of them with magnitudes close to six (Richter), have been strong enough to cause not only widespread concern but also damage structures, including in at least one case damage to the dam itself. Nevertheless, in most cases the filling of reservoirs has not been accompanied by any significant increase in local or regional seismicity. It is believed, therefore, that special geotectonic and/or hydro-geological conditions are required for the triggering of earthquakes of engineering importance. ... "In the present state of knowledge regarding the seismic effects associated with reservoir, it is impossible to predict with certainty whether hazardous earthquakes are likely to be triggered by the filling of a large reservoir."

In this general context Rothe considers, "Man plays the role of sorcerer's apprentice; in trying to control the energy of rivers he brings about stresses whose energy can be suddenly and disastrously released." From a number of detailed studies he and another international expert Simpson conclude: "It is extremely difficult to establish the geological conditions under which induced earthquakes will occur". Simpson agrees. Nonetheless, he argues that on the basis of our limited experience — a general pattern has emerged. Thus, the potential for induced seismicity appears to be highest "in areas of strike slip or normal faulting"; induced activity has proved to be most common "in areas of high to moderate strain accumulation"; and "areas of low strain accumulation" such as "stable interiors or pre-Cambrian shields appear to carry the lowest risk of induced seismicity". That said, however, it should be noted that the Aswan Dam is situated in just such an area of low strain accumulation — as are the Akosombo and Bratsk dams, both of which have also experienced induced earthquakes. Indeed such is the paucity of our knowledge of induced seismicity that Simpson concludes: "Since no diagnostic criteria appear to be presently available for determining the risk of triggering induced earthquakes all 'large reservoirs' must to some extent be considered potential sources of induced activity".

The Vainot Dam (Italy) is a failure, particularly relevant in considering the Himalayan situation. It relates to a high dam, evidently unstable slopes and RIS: "The Vainot Dam is 261 metres high and the volume of the water contained in its reservoir is 150 Mm^3. Filling of the reservoir was started in February 1960, and the water reached its maximum height in August 1963. The reservoir was partly emptied in 1961, and seismic activity fell to almost zero. It was then filled again, the water reaching 155 metres in April 1961. Fifteen shocks then occurred, all between April and May of that year. In September 1961, the lake level reached a height of 180 metres; 60 shocks were registered in the first 15 days of that month and, at the same time, an earth movement started along the slope of Mont Toc above the lake. That movement accelerated in October and caused a landslide which gave rise to a giant wave that flooded the valley beneath, wiping out several villages and killing more than 2,000 people." As in the other cases cited by Rothe, there is a clear relation beween the frequency of shocks and the progress of filling the reservoir — vide Wadebridge Ecological Centre

Catchment area

No data based information is available on forest cover in the catchment area from the Forest Department, nor is there accurate information from other sources. However, vegetative cover is about 15 to 20 per cent in the catchment area as against the policy requirement of 60 per cent tree cover in hill areas. It is now accepted that perennial springs near villages have dried up and village women have to spend considerable time to obtain water from distant sources. It is unfortunate that the geomorphological study of the catchment area was not done. This is a vital element in relation both to the life of the dam and the impact downstream. Even if the TDP authorities' view of the limited significance of the impact of the catchment area conditions has some basis, the data available shows that the possibility active thrusts in the dam area needs very detailed examination which has not been done. An independent detailed study of catchment area remains essential for any assessment of the impact of the condition on the Tehri Dam or on any other large and medium dams.

Flood control

The grave degradation and deforestation of the unstable slopes add substantially to soil erosion and increase the snow melt and monsoon run off with little water retention to maintain the flow during the rest of the year. The main source is from the 1875 sq kms of the 7511 sq kms under glaciers. Melt from them continues from February to October, generally speaking, to coincide with the height of the monsoon, complicating flow calculations and increasing flood potential. The combination renders meaningless any estimates of hundred year and thousand year floods. In addition, the recession of the glaciers, including the Gangotri glacier, has left large morainic stretches exposed which, with the impact of freeze-thaw action in an area 12 to 15 per cent of the catchment, adds considerably to the silt carried by the rivers and their tributaries. The Ganga basin thus combines significant monsoon precipitation with substantial glacial melt.

In the final recommendations of the Working Group's report, it emphasized the importance of mini and micro hydro-power schemes and those which did minimum damage to the environment. This coincides with the Planning Commission recommendation that such economically quick gestation projects should be given priority. Unfortunately, the hydro-power specialists have given very little attention to the immense potential in this field, partly because there is little prestige and limited financial allocation. A dramatic indication of the immense potential is provided by the creation, in China between 1949 and 1983 of 8,500 megawatts (MW) of hydro-power from 76,000 micro and mini projects and since then has added 1000 MW every year by this means. Since most of this is allocated for rural electrification with consequent decentralization it results in a substantial reduction of transmission losses and the economic and environmental cost of transmission lines.

The details and the scope of Russian involvement are still shrouded in secrecy. Public announcements that the installed capacity will be 2000 MW, for which the appraisal was done, clearly involves construction of the Koteshwar Dam downstream as a storage for water. Implications have, obviously, not been examined and the project has been approved despite the absence of environmental clearance and without even environmental appraisal of the additional impact of the second unit.

The Russian experts have reportedly expressed confidence about dealing with all the environmental aspects. No information is available about events in Russia but there is considerable information and controversy about the immense social, economic and environmental damage, done to Egypt by the Aswan Dam constructed by Russian experts. There are fortunately or unfortunately some common features. Egypt has from earliest times been dependant on the Nile. India's past, present and future rest on the interrelation between the

structurally unique Himalayas, the Ganga and the vast alluvial Gangetic plain. As in Egypt there are socio-cultural links but for Indians there is no break in the timeless religio-cultural traditions reaching back many millenia before recorded history, as important today as they were then.

The Aswan Dam represents an impressive structural achievement. The Russian and Indian engineers can construct an equally impressive high dam in the Himalayas. However, let us not face, as for the Aswan Dam, through lack of comprehensive and accurate data, the environmental consequences of such a massive interference of the life-giving holy Ganga. President Mubarak's own words best illustrate the immeasurable negative consequences for Egypt of Aswan. At a recent meeting seeking help to solve "the major challenges that Egypt will face between now and the year 2000", he emphasized the need for serious scientific study of the problems. He concluded, "Among these the secondary effects of building the Aswan Dam require your special attention. To overcome them is, in effect one of the main challenges Egypt has to face". To many technicallly experienced observers there is almost no solution other than to revert to the old pre-Aswan dam as the following major consequences of Aswan make clear.

Egypt has learnt to its cost how the Aswan Dam, despite an important augmentation of irrigation and of hydro-power, has done incalculable damage to the natural environment, disrupting 7000 years of annual natural regeneration of the soil, changing the condition of the Nile delta and damaging the fish-rich lagoons at the mouth of the Nile through the blockage of the nutrient filled silt above the dam. The dramatic changes in the upstream environment have increased the silt load to such a degree that the estimated annual loss of 60 million cubic metres of storage per year on which the 500 years' life of the dam is based, has increased to such a degree that a recent satellite-photo-based study now estimates that the life of the Aswan Dam is not likely to be more than 50 years. Health-wise, the increase of schistosomias in the four areas studied only three years after perennial irrigation, has risen from 10 to 44 per cent, 7 to 50 per cent, 11 to 64 per cent and 2 to 75 per cent.

There is considerable waterlogging and water channels are so clogged that even an input of US $ 600 million by the World Bank has according to a later World Bank survey, failed, and the salinity of the Mediterranean is reportedly increasing, at least partially, because of the Aswan Dam. Only some of these consequences were even marginally anticipated and to correct them Dr Tolba, Executive Director, UNEP, mentioned in a Delhi NCEP meeting that he, as the then Egyptian Minister in charge, had estimated the cost of correction a few years after construction would be over US $ 1000 million. The other aspects have increased the life-sustaining struggle of the vast rural majority.

The crucial issue rests on the advisability of building high dams in the Himalaya. Harsh Gupta's study considers the earthquake risk too great. At a public presentation chaired by the Irrigation Secretary in 1986 he presented this view. In response to the Chairman's questions whether in the light of what he had said it was not right to build the existing dams. Harsh Gupta said, "I am afraid so!" A 1980 study by the UP Irrigation Department provides obliquely a basis for his view: "It is a well known fact that the Himalaya have not attained their Isostatic Equilibrium. The movements related to the attainment of Isostatic Equilibrium are unnoticeable, being of the order of a few inches per thousand years and are simultaneously occurring in a very vast area in the entire Himalayas, in which Tehri Dam site occupies an insignificant area. Hence, these movements will not affect Tehri Dam or the reservoir. If, for arguments sake, it is presumed that these movements will adversely affect Tehri Dam and reservoir then they will affect all the existing and future dams located in the Himalayas and therefore no dams should have been or should be constructed anywhere in the Himalayas."

A UP Irrigation Research Institute study on Sedimentation Problems of the Tehri Dam records conclusion which serve to emphasize the ureality of the siltation study and the

calculation of the life of the Tehri Dam: "Sediment problem is a complicated one and the science dealing with the formation, transportation, deposition, measurement, analysis and treatment of sediment is still in a developing stage and needs consistent efforts for improvement.

Himalayan rivers carry comparatively large quantity of sediment due to unstable and steep slopes with rocks highly fractured, folded and faulted.

These sediment loads cause heavy damage to hydro-power stations by abrasion, to water conductor systems and the runner blades, and reduce useful life of the reservoir.

The concept of life of reservoir has not been generally properly understood. It is not correct to assume the life of reservoir as the designated period of 50 or 100 years for which the provision of silting is made in the reservoir capacity in the form of dead storage. Every year there is encroachment on live storage as well. A plot showing the available capacity versus time can be developed and from this plot it would be easy to ascertain the time when the project will fail to meet the minimum basic demand as originally fixed and this period is termed as the useful life of the project."

Experience as at Maneri Bhali Stage I is itself a typical case where failure to consider the impact on the turbines of the heavy silt-load caused considerable damage. It also resulted in stoppage of work and considerable wasteful expenditure directly and through failure to generate power when out of action.

Whatever may be the reasons for clearing a project with such a dire disaster potential there can be no possible justification without extensive expansion of the data base on seismicity and siltation and corrective action for the many points listed in the Interim Report and repeated in more detail in the final report. Action is necessary on a number of other issues raised, such as measures to alleviate local hardship and reduce stress on the environment, a more comprehensive enlightened rehabilitation programme, creation of a high level catchment area authority and introduction of dam safety legislation. The large issue of the relationship between initial cost-benefit estimates and the project completion ones is crucial to ensure most effective utilization of scarce financial resources.

None of the projects under consideration or construction should proceed without detailed data-based Environmental Impact Assessments. This should be done professionally and subject to public scrutiny. This is essential because a resemblance that the EIA for the Narmada projects bears to a scientific study is purely accidental.

In the case of Tehri, in the light of 200 deaths, about 2000 injured and a damaged township at Koyna following a Reservoir Induced Earthquake, magnitude 6.3, an in-depth risk analysis is mandatory, based on extensive seismicity data and information on the geomorphology of the catchment. The occurrence of earthquakes of magnitude seven with 100 metres of the Tehri Dam indicate tension build up leading to a magnitude of eight or more during the life of the dam. None of the experts disagree about this. The structural design of the dam has been done on this basis. The impact of one in the area of the dam or in the catchment or one of less intensity near the dam site or the reservoir will result in a catastrophic tragedy for Rishikesh, Hardwar and beyond: Neither the promoter nor those who build the dam will be around to bear responsibility.

Narmada Issue: An overview

KAVALJIT SINGH

The Sardar Sarovar Project (SSP) in the state of Gujarat and the Narmada Sagar Project (NSP) in the state of Madhya Pradesh are, at present, the major constitutents of the composite Narmada Valley Project (NVP) consisting of 30 major, 135 medium and 3000 minor dams. According to an estimation, the cost of the whole project would be around Rs 25,000 crores over the next 25 years. The present estimate for the NSP and the SSP is Rs 3,450 crores and Rs 12,000 crores respectively.

The state governments claim that the SSP and the NSP would irrigate 1.9 million hectares (mh) and 0.14 mh of land and generate 1450 mw and 1000 mw of power respectively. The hydro-electric power of the SSP would be shared by the states of Gujarat, Maharashtra and Madhya Pradesh, whereas, the irrigation benefits would accrue to the state of Gujarat and Rajasthan. On the other hand, all irrigation and power benefits of the NSP would accrue to Madhya Pradesh only. It should be mentioned here that without the NSP, the SSP would not be able to achieve its full potential of irrigation and power, as it needs regulated water supply, from upstream.

These projects had been hanging fire for many years for want of environmental clearance from the Ministry of Environment and Forests. Recently, the Government of India has given clearance to the construction of the SSP in Gujarat and the NSP in Madhya Pradesh. But very few will dispute the fact that the ecological impact of these projects has not been properly studied.

The studies done so far, to assess the ecological damages, have either been found to be inadequate or the follow-up action to rectify the damages not upto the mark. The Government of Gujarat commissioned a study, Sardar Sarovar Narmada Project Studies on Ecology and Environment. This study was carried out by the Department of Botany, MS University, Baroda in just six months, not taking into consideration the seasonal temporal variations in the climate and many other important parameters. It is important to note that this study was commissioned after the work on the project was started. Moreover, much of the information in this study derives from government data, rather than from fresh, independent empirical data.

Similarly, the Environment Planning and Coordination Organization (EPCO), Bhopal, also carried out a study to assess the environmental impact of the NSP. This study is an almost worthless exercise because it is based on secondary data, which was at times found to be contradictory. The introduction of this study says, "The study has been taken primarily as a desk exercise... The report has relied on secondary information". Such a report can hardly be passed off as a legitimate environmental study.

There are also studies like, Environmental Impact of Narmada Sagar: A Case Study, conducted by Consulting Engineering Services Pvt Ltd, New Delhi and Surface and Subsurface Drainage Study in Command Areas of Narmada Sagar and Omkareshwar Project conducted by Indian Institute of Sciences, Bangalore. But these studies can be considered as a piece-meal approach to the whole project where only one or two dams are concerned.

Both environmentalists and social activists have raised several serious objections to these projects. Some of these objections are discussed below:

Submergence of forests and agricultural land

In the case of the SSP, about 10,000 hectares of forest land will be submerged. While, in the case of the NSP the position is even worse. The NSP will submerge 40,332 hectares of forest land.

The forests to be submerged are basically teak with excellent strands of bamboo, saj, bija, anjun, salai, mahuwa etc. The only pure strand of anjun left in India is located in the Dewas district of Madhya Pradesh. It is important to note that these species are not naturally regenerating anymore.

Although the Madhya Pradesh State Policy on the NSP says, "for all forest area submerged in the project, an equal area will be taken up under compensatory forestry", the same document also states that big chunks of land are not available in the nearby districts of the submerged area. But the question is—where is all the land (40,332 ha) for afforestation going to come from?

An amount of Rs 31 lakhs has been allocated for the afforestation in Madhya Pradesh. According to a conservative estimate, an amount of Rs 15,000 is required for replanting trees on one hectare of land. Taking this figure into account, an amount of Rs 31 lakhs can be used in replanting trees in 206 hectares only. Even if, with extra finances, all the lost forest is replaced, the loss of a natural forest which has evolved over millenia cannot ever be replaced.

A large amount of agricultural and grazing land will also be submerged due to the construction of these projects. Since most of the agricultural land is situated close to the river Narmada, it is highly fertile and produce fine yields of wheat, jowar, cotton etc. In the case of the NSP, the official document says, "big chunks of cultivable land are not available in Khandwa, Khargone, Dhar, Jhabua, Dewas, Hoshangabad and other districts.... In these circumstances the only course left is to allot the affected families small bits of government land available in the nearby districts of the submergence area." If the policy is followed, it would lead to serious socio-cultural disruptions in the life of the potential oustees. Whereas a report carried out by National Institute of Urban Affairs (NIUA), New Delhi, mentions that adequate areas in every district would be available for being allotted to the oustees, no serious attempt has been made by the project authorities to find out the cultivable land for the allotment to the potential oustees.

Besides, some mineral rich land especially areas containing dolomite worth crores of rupees would also be submerged.

Loss of wildlife

The submergence of forests also results in the loss of flora and fauna. The project report of the NSP says, "The impact of the project on the wildlife shall be nil. Since wildlife has got natural characteristics of shifting to nearby jungles wherever it is felt unsuitable to them". In other words, the wildlife will relocate itself. Similarly, the policy document prepared by the Government of Madhya Pradesh says, "Wildlife in submerged forests will be guided to adjacent localities. Protection of the wildlife will be the responsibility of the forest authori-

ties." These statements are not only contradictory to each other but also reflect the attitude of the project authorities towards the fate of wildlife which consists of several rare and endangered species. Furthermore, till date, there is no inventory of the species of plants and animals found in the forests to be submerged. These studies have only now been commissioned.

Displacement and rehabilitation

Both these projects will displace nearly two lakh people from their habitats. Official sources state that in the case of the SSP, 182 villages of Madhya Pradesh, 36 of Maharashtra and 19 of Gujarat will be submerged. While, the NSP will submerge 254 villages of Madhya Pradesh. These figures are not correct. These figures only include revenue villages. In a recent field-report brought out by a non-governmental organization called Multiple Action Research Group (MARG), New Delhi, there is a mention of six forest villages of tehsil Barwani (Dist. Dhar, Madhya Pradesh) which will also go under Sardar Sarovar's waters along with revenue villages. But in official records, there is no mention of these forest villages in the list of submerging villages. Similarly, no attempt has been made to list those villages which will be affected by the backwater effect. If these and other figures are taken into account, the figure of the affected population would be much greater than official figures.

Out of about 25,000 affected people by the SSP in Gujarat and Maharashtra, over 90 per cent of them are tribals belonging to Bhil and Tadavi tribes. Majority of them are landless falling under two categories, traditional tribal cultivators with no title of land and the real landless agricultural labourers as found in many villages of Madhya Pradesh. For the forest-dwelling tribals, the most serious impact of displacement is the breakdown from their natural surroundings. It must be emphasized that the forest and the river play a central role in their cultural and economic life, neither will be available at resettlement sites.

The families affected by submergence of the SSP are to be rehabilitated as per terms of the Narmada Water Disputes Tribunal. Although the directives of the Tribunal are a marked improvement on past rehabilitation policies, they contain serious loopholes and omissions. Firstly, the Tribunal's Award relates only to oustees from Madhya Pradesh and Maharashtra. Secondly, only those families from whom more than 25 per cent of its land holding is acquired shall be entitled to irrigable land with a minimum of two hectares. Lastly, there is no mention of resettlement and rehabilitation of forest-dwellers who are eking out a living on common property resources. Besides, the majority of potential oustees of Madhya Pradesh are not aware of any of the directives laid down in the Award. According to MARG's report, the directives laid down in the Award have been misquoted to the potential oustees by the project officials.

In the case of Maharashtra and Gujarat, the implementation of the various provisions has been far satisfactory in the initial phase of resettlement and rehabilitation. According to Medha Patkar, an activist of Narmada Dharangrasht Samiti, the land for land policy has largely failed in the state of Maharashtra. While in the case of Gujarat, the state government has not bothered to find adequate land for the oustees. Many oustees of Gujarat complained that the lands which were sold to them were already encumbered with heavy debts. Similarly, many oustees were given lands which the same SSP was about to acquire for the construction of canals. In many cases the cash compensation has been inadequately paid. According to a news report, the lands acquired in the village Panchmuli, Gujarat, were to be compensated at the rate of Rs 5700 per acre, whereas, the oustees were paid Rs 4600 only per acre. Furthermore, the resettlement sites do not have adequate supply of drinking water. Till date, civic amenities like electricity, school, panchayat ghar, etc. have not been provided in a resettlement village, Suka.

In the case of NSP oustees families will be resettled as per term of the Madhya Pradesh Pariyojana Ke Karan Visthapit Vyakti (Punhsthapan) Adhiniyam, 1985. The state govem-

ment has also laid down a rehabilitation policy for the oustees of the NSP. The policy document says, "Big chunks of cultivable land are not available in Khandwa, Khargone, Dhar, Jhabua, Dewas, Hoshangabad and other districts... In those circumstances the only course left is to allot the affected families small bits of government land available in the nearby districts of the submergence area." Even, the DOEF in its report says, "Total land requirement of 40,000 ha for rehabilitation has not yet been identified, let alone surveyed for its capability, etc." It is clearly evident that there is no enough land available to fully implement the 'Land for Land' policy in Madhya Pradesh. As a result, worst affected are likely to be the forest dwellers, totally unfamiliar with the market dominated world outside their habitat. Displacement for them is likely to be culturally, socially and emotionally traumatic.

Water-logging

Every year a large part of good and fertile land is rendered unproductive and barren in almost all the irrigation projects. The annual increase in soil salinity and water-logging was as high as 50,999 ha and 27,000 in Ramganga project area in Uttar Pradesh. Similarly, about 25 per cent of arable lands of Punjab and Haryana are affected by water-logging and soil salinity. In the Narmada projects, the problem of water-logging and soil salinity is expected to be serious because the command areas of the projects have largely black soils which have very good water retention capacity. A study by Indian Institute of Science, Bangalore, found that about 40 per cent of the NSP's command area can get water-logged unless stringent preventive measures are taken. Significantly, the cost of these measures does not figure in the original cost-benefit analysis for NSP, which was the analysis submitted to get approval.

Catchment area treatment

There is no denying the fact that the catchment areas of the river Narmada are subject to heavy ecological degradation. If this is not properly checked, the deforestation would result in increasing soil erosion, leading to siltation and sedimentation and thereby reducing the life-span of the reservoirs. There is no comprehensive study on the existing state and future demands on the catchment forest in the Narmada Valley. However, an expert committee has looked into the matter for a part of the area and suggested a Rs 50 crore scheme to treat the catchment. But as the Department of Environment report points out this study was commissioned several years before the projects were sanctioned. At the moment even full studies have not been carried out.

Cost-benefit analysis

A project is sanctioned by the Planning Commission only when the cost-benefit ratio is 1 to 1.5 that is, for every rupee spent there must be a return of at least Rs 1.50. It has been found that the CB ratio is often distorted by exaggerating the benefits and underplaying the costs, so as to get the project sanctioned. Environmentalists have pointed out that the CB ratio for the NSP and the SSP has been inadequately carried out. They have made the following points, among others:

(i) The costs of land acquisition have been underplayed.

(ii) The allocation of money for compensatory afforestation is inadequate and distorted. For the NSP, it is Rs 3.1 million for afforestation of 40,332 ha whereas, it is Rs 50 million for afforestation of 10,000 ha in the case of the SSP.

(iii) The value of the forest land has been calculated only in terms of commercial products. The loss of ecological benefits of forests is not considered in the analysis.

(iv) The loss of wildlife is omitted from the CB analysis.

(v) The cost of preventive measures for water-logging is also omitted from the CB analysis.

(vi) Due to delays in the clearance of these projects, present costs of construction run much higher than anticipated.

Others

On the basis of experience gained so far in our country and elsewhere, environmentalists and social activists have anticipated many other negative impacts of these projects. Some of them are:

(i) Seismicity—a hotly debated issue where there seems to be more confusion than clarity.

(ii) Contamination by pollutants, pesticides and minerals.

(iii) Salt-water ingress at the mouth of the river due to reduced water flow.

(iv) Spread of water-borne diseases in the command area.

(v) Impact on aquatic ecology.

Unfortunately, there is as yet no in-depth study on many of these.

On the basis of the above-mentioned serious inadequacies and distortions **we strongly demand that** all the initial assumptions and ideas have to be reevaluated before pushing ahead with these projects.

The following steps should be taken to prove inadequacies and distortions in the existing assessments.

(A) Independent assessments

There is an urgent need of detailed sociological and anthropological sudies on the existing socio-cultural lifestyle of the potential oustees and the likely impact of the changes brought about by these projects. Equally vital are studies on the environmental impact. It is also necessary that independent cost-benefit analysis of these projects be carried out to judge the feasibility and viability of these projects.

(B) Public awareness and the mass media

The full utilization of communication techniques including the mass media would help in creating widespread awareness and understanding of these issues. Activities like exhibitions, dramatics, film-shows, publication of articles, books, etc. can be carried out to bring awareness at different levels.

(C) Local people's action

Oustees of Maharashtra and Gujarat have been able to organize themselves and demand better rehabilitation with the help of Narmada Dharangrasht Samiti/SETU and Chhatra Yuva Sangharsh Vahini. There is little sign of this among the potential oustees of Madhya Pradesh. It is important to note that out of the total 491 submerging villages (from the NSP and the SSP), 436 villages (over 90 per cent) are situated in Madhya Pradesh alone. In Madhya Pradesh two local based organizations called Narmada Ghati Sangharsh Samiti, Harsud and Narmada Ghati Nav Nirman Samiti, Tavlai, are working in these areas. But in the existing socio-political situation, these samitis have not been able to organize the potential oustees.

Research institutions like MARG, SWRC, are also working in these areas. There is an urgent need to organize oustees of Madhya Pradesh.

(D) Legislative measures

Both the projects involve a displacement of nearly two lakh people. Many of them are eking out a living from common property resources. There is no comprehensive resettlement and rehabilitation scheme for these in the directives and rules laid down yet. A petition on behalf of these people can be filed under Article 21 of the Constitution of India which says, "No person shall be deprived of his life or personal liberty except according to precedure established by law."

Similarly, a petition proving the inadequacies and distortions in the existing assessments can also be filed in the court.

REFERENCES

1. Kalpavriksh and the Hindu College Nature Club—The **Narmada Valley Project: Development or Destruction 1984.**
2. Department of Environment and Forests—**Environmental Aspects of Narmada Sagar and Sardar Sarovar Multipurpose Projects**, undated.
3. Mathew Kalathil—**Sad Story of the Oustees of Sardar Sarovar**, Economic and Political Weekly, August 15, 1987.
4. SC Verma—**Human Resettlement in Lower Narmada Basin** 1985.
5. Multiple Action Research Group—**Sardar Sarovar Oustees in Madhya Pradesh: What Do They Know?** (3), 1987.

The Impact of Subarnarekha Multipurpose Project on the Indigenous People of Singhbhum

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This paper is divided into two parts. In the first part we examine the process of development that is taking place in Singhbhum, which is very rich in minerals and forests, and see the situation of its indigenous people vis-a-vis this development. In the second part we critically look into the specific impact of Subarnarekha Multipurpose project on the indigenous people of Singhbhum .

The district of Singhbhum forms the south-eastern portion of the Chotanagpur division in the state of Bihar. It is bounded on the north by the districts of Ranchi (Bihar) and Purulia (West Bengal), on the east by Midnapur district of West Bengal, on the south by Keonjhar and Mayurbhanj districts of Orissa, and on the west by the districts of Ranchi and Sundergarh (Orissa). Singhbhum district forms part of the southern fringe of the Chotanagpur plateau and is a hilly upland tract. The level land in the district is largely confined to the valleys of the South Koel and Subarnarekha, the two principal rivers of the district.

The Subarnarekha river originates in the Ranchi district, 16 kms west of the city of Ranchi. It enters Singhbhum from the north-west and flows through Dhalbhum sub-division for almost 110 kms, leaving the district at its south-eastern extremity. The river makes a total run of about 500 kms through Bihar, West Bengal and Orissa and terminates at the Bay of Bengal to the east of Balasore. The principal tributary of Subarnarekha in Singhbhum is the Kharkai which is formed by the two streams of Torlo and Koranjai in the Kolhan area of the district.

Subarnarekha literally means 'streak of gold'. This name is significant because auriferous sand is found on the riverbed. In fact, the whole of Singhbhum district, especially the Subarnarekha basin, is one of the most important areas in the country for its vast mineral deposits. The Kolhan series of iron ore in Singhbhum is one of the richest iron-belts in the world. Most of the important non-coal minerals are available here. The notable minerals of the district are iron, copper, kyanite, manganese, uranium, chromite, asbestos, apatite, china-clay, gold, limestone, silica, soap-stone and quartzite.

Singhbhum district is also very rich in forests. Some of Asia's best sal forests lie in the Kolhan area of Singhbhum. Of the total area of 5,152 sq miles more than one third is under the Forest Department. During the year 1976-77 forest revenue from Singhbhum was Rs 3.15 million which constituted about 22 per cent of the total forest revenue of Bihar.

Singhbhum is thus one of the richest districts in the whole country, rich in minerals and forests. Further, development activities for the exploitation of the wealth of this district are taking place at a very fast rate. There are few districts in the country which are developing as fast as Singhbhum is. But the important question is who is benefiting from the type of development that is going on in Singhbhum? Before we consider this question let us first look at the people who inhabit this district.

The people of Singhbhum

Singhbhum has been, for ages, the homeland of aboriginal races such as the Hos, Santals, Mundas, Bhumij, Bhuiyas, Gonds, Turi, Oraons, Kharwars, Kharias, Bathudis, Birhors, Savars, Bedias, Koras, Loharas, Mahlis, Tamarias, Bauris, Dom, Ghasi, Pan, Kamar, Kumhar, Kurmis. These are the indigenous people of Singhbhum. They are also known as Adivasis which literally means 'original settlers', 'earliest settlers' or 'autochtones' (Roy Chaudhury 1958: 237).

Who are indigenous peoples? The United Nations Sub-Commission on Prevention of Discrimination and Protection of Minorities has given the following definition of indigenous peoples:

> Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and precolonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their own cultural patterns, social institutions and legal systems (ILO 1987: 27).

The most striking aspect of this definition is the pin-pointing of the fact that indigenous peoples live in colonial relationships. The colonialism under which they live is either internal or external or both. The indigenous peoples have a historical continuity with the pre-colonial societies that have developed on their territories. They have a distinct culture and identity which they are determined to preserve. Further, the indigenous peoples have a special relationship to their land. They are an integral part of the land they have traditionally used and occupied. Their identity and culture is rooted in their land. In contrast to the cultures of other peoples it is this relationship which is a unique feature of their cultural identity. As a result they are more sensitive to the need to protect their land from environmental deterioration than those who have or would take their land for the so-called development projects. Their societies are community-based. Land is owned communally. Community life is cooperative and is based on sharing. Decisions are taken jointly through consensus. They consider their societies to be classless, egalitarian and close to nature. On the other hand they see the societies around them as highly exploitative, stratified, centralized, individualistic, anti-nature and highly secular. (Bodley 1982: 168).

We can have an idea of the various indigenous communities of Singhbhum, which have a historical continuity with the precolonial society of this area, by examining the earliest available census data and reports of this area. Singhbhum came under colonial rule in the year 1837 when the British subjugated the valiant Ho tribals of Kolhan and brought them under their direct control. The first comprehensive census of the whole district was taken in the year 1872. It showed that more than 95 per cent of the total inhabitants of Singhbhum

Table 1

PROPORTION OF ST, SC, OBC AND OTHERS TO THE POPULATION OF SINGHBHUM IN THE YEAR 1872

Scheduled Tribes	62.70%
Scheduled Castes	2.50%
Other Backward Classes	30.54%
Others	4.26%
Total	100.00

Source: Hunter 1877: 39

belonged to the present day Scheduled Tribes (ST), Scheduled Castes (SC) and Other Backward Classes (OBC). Table 1 gives the proportion of ST, SC, OBC and others to the total population of Singhbhum in the year 1872.

According to the classification in Hunter's report (1877: 39), 68.6 per cent of the total population of the district belonged to Aboriginal Tribes and Semi-Hinduised Aboriginals. Of the rest, the majority were Goalas (8.75 per cent), Kurmis (4.74 per cent), Tantis (5.00 per cent), Kamar (1.92 per cent), Kumar (1.72 per cent) and Ghasis (0.95 per cent). According to some scholars, many of these also, like the Kurmis, Magadh, Goalas, belonged to aboriginal tribes. For example, Risley and Grierson considered the Kurmis of Chotanagpur to be an aboriginal tribe of Dravidian stock. All these groups of people comprise the earliest settlers of Singhbhum. Many of them like the Hos, Bhumij, Bhuiyas, have the traditions of being the first settlers in many parts of Singhbhum. They claim that they first cleared the jungles in these areas and established khuntkatti villages. They have distinct cultures of their own which they want to preserve at any cost. They form the indigenous people of Singhbhum. The population of Singhbhum in 1872 classified according to the major indigenous groups is given in Annexure I.

Of the indigenous groups in Singhbhum, the Hos, Santals, Mundas and Bhumijs are the most numerous. Their numbers and percentages to total population during different census are given in Annexure II. The Hos who constituted about 36.4 per cent of the total population in 1872 is the most important tribe of the district. They are concentrated in the Kolhan area where they formed 71 per cent of the total population during the Settlement of 1898. They were known as Larka Kols or fighting Kols and they successfully maintained their independence through various hard fought battles. Together with the Mundas they were the leaders of the Great Kol Rebellion of 1831-32, which shook the very foundations of British rule in Chotanagpur. After protracted struggle for 15 years the British finally subjugated them in 1837. A special tribal reserve called the Kolhan Government Estate was created for them and an indigenous system of administration based on the Munda-Manki system was adopted for this area. The struggle of the freedom loving Larkas did not stop however. In 1857, they revolted against the British colonial rule under the leadership of Raja Arjun Singh of Porahat. Again, under the leadership of the great Birsa Munda, the Hos, together with the Mundas and other indigenous people of the area, fought a valiant battle to drive away the British from the area.

Another valiant indigenous group of Singhbhum who fought against the British for a long time to preserve their freedom is the Bhumij (which means autochthon) of Dhalbhum. The British called them Chuars (robbers) and their struggle for independence as Chuari Larai. The most important of these struggles was the revolt of 1832 under the leadership of Ganga Narain of Barabhum. In this revolt, as Dalton says "the reputed, invincible and irrepressible Larkas" also took part. (Dalton 1872: 175).

The history of the indigenous people of Singhbhum is a history of struggles against the alien exploiters (British and others) whom they contemptuously called 'dikus'. These 'dikus' or outsiders have gradually penetrated into their area for the exploitation of its wealth and have reduced them to a non-dominant position.

There has been tremendous increase in the influx of these outsiders to Singhbhum during the last 50 years. This is evident from the fall in the proportion of SCs and STs in the total population of Singhbhum as can be seen from the following table.

Table 2

PROPORTION OF SCHEDULED CASTES AND SCHEDULED TRIBES IN THE TOTAL POPULATION OF SINGHBHUM (1931 to 1981)

Year	SC	ST	SC+ST
1931	4.66	54.08	58.54
1941	5.04	52.99	58.09
1951	4.19	44.94	49.13
1961	2.92	47.31	50.23
1971	3.60	46.12	49.72
1981	4.79	44.08	48.87

Table 3

SCHEDULED CASTES AND SCHEDULED TRIBES EMPLOYED IN INDUSTRIES IN SINGHBHUM (1971)

Industry	Total workers	SC	ST	SC+ST	Percentage of SC+ST
1. Mining and quarrying	19,226	1,376	6,623	7,999	41.60
2. Household industry	20,036	3,143	5,449	8,592	42.90
3. Other than household	95,851	3,952	14,331	18,283	19.00
4. Construction	7,379	304	2,108	2,412	32.70
5. Trade and commerce	28,377	491	1,184	1,675	5.90
6. Transport, etc.	25,294	1,309	5,168	6,477	25.60
7. Other services	47,390	3,828	10,089	13,017	29.40
Total	**2,43,553**			**59,355**	**24.40**
Total workers (including agricultural, etc.)	8,09,170	30,703	4,07,833	4,38,536	54.20

Table 2 shows that in Singhbhum the proportion of the STs and SCs to the total population fell from 58.54 per cent in 1931 to 48.87 per cent in 1981; the proportion of STs alone fell from 54.08 per cent in 1931 to 44.08 per cent in 1981. The following statistics give further indication of the extent of the influx of these 'outsiders' to Singhbhum where industrialization started at the turn of the century with the founding of Jamshedpur.

According to the Singhbhum District Gazetteer, "At the time of the Settlement in 1867 there were only 1,569 foreign cultivators in Kolhan; but by 1897 their number had increased ten-fold, that is to 15,755." (Roy Chaudhury 1958: 359).

In 1951 there were 1,96,106 persons living in Singhbhum (excluding the area incorporated in the district in 1954 and 1956) who came from outside the Chotanagpur area. In 1961 their number increased to 2,55,000. In 1971 there were 3,10,253 persons living in Singhbhum who were born outside the Chotanagpur region. They constituted 12.73 per cent of the total population of the district.

Development of Singhbhum

We have seen that Singhbhum is one of the richest districts in the country and that majority of its inhabitants are indigenous people belonging to SCs, STs and OBCs. The district is developing very fast and there are few districts in the country which are developing as fast as Singhbhum. The last few decades have witnessed tremendous increase in industrialization and urbanization in this district. But who has benefited from this development?

A look at few facts can give us an indication. Singhbhum has registered a phenomenal growth in urbanization and has the highest proportion of urban population in Bihar. The number of towns in Singhbhum increased from four in 1931 to 24 in 1981. However, in 1971 out of the total urban population of 6,39,764 in Singhbhum only 16.2 per cent were SCs and STs, although they constituted 50 per cent of the total population of the district. Further, most of these 16.2 per cent people lived in the slum areas of the towns.

A look at the number of ST and SC workers engaged in different industrial categories in Singhbhum (see Table 3) shows that though they constitute 50 per cent of the total population and 54.2 per cent of the total working force in Singhbhum their share in benefits arising out of the development of the district is minimal.

Table 3 shows that only 24.4 per cent of the total workers employed in different industries in Singhbhum belonged to SCs and STs. In the urban areas of Singhbhum only 15.9 per cent of the total workers employed in different industrial categories belonged to SCs and STs. What is more important is the fact that most of them belonged to the lowest paid unskilled category of workers and work as rejas and coolies in these industries. Most of them live in the slum areas of the towns. The immigrants who constitute about 13 to 15 per cent of the total population of Singhbhum have appropriated most of the employment opportunities opened up in the area by the large scale developmental activities of the last few decades.

There are more than 250 mines in the Kolhan area alone of Singhbhum. Most of these mines are privately operated by contractors coming from outside Chotanagpur. In many cases they illegally take away the land for mining purposes after driving out the tribal raiyats from their agricultural lands. They destroy the tribals' worshipping and burial places, sometimes give them a nominal sum as compensation and start mining, often with the help of the local police and the goondas. The original owners are made to work as rejas and coolies in their own land at starvation wages. As a result of haphazard and illegal mining, vast areas of tribal agricultural lands all over Singhbhum have been dug up and laid waste. The irony of the situation is that raiyats are still paying the malguzari (land tax) on these lands and also on lands under mining operation which have been forcibly taken away from them.

For the indigenous people land and blood are homologous. To separate them from their land is tantamount to tearing them apart from their life-giving source. But development and industrialization have meant precisely that for many of them. A large number of indigenous people have been illegally dispossessed of their lands. Many have been forced to leave their homes to work in the brick kilns and stone quarries of North Bihar, West Bengal, UP, Punjab and other places as contract and even bonded labourers. The gaping holes of abandoned pits scattered all over Singhbhum left after the plundering of its mineral wealth symbolize prophetically the ultimate fate of the indigenous people of this area.

A critical analysis of the forest policies and practices in Singhbhum shows that the most important characteristic of both colonial and post-colonial forest policies has been the increasing assertion of state monopoly rights over forests at the expense of indigenous communities.The forest policy statement of both 1894 and 1952 legitimatized this exclusion in the name of 'national interest'. The ideology of 'national interest' has been the main weapon used by the dominant class to usurp the rights of the indigenous people and to suppress any discontent among them. 'National interest' is a euphemism for the interest of the dominant class who control everything for their own benefit.

The progressive assertion of state monopoly rights over large areas of forests by turning them into 'reserves' (for whom?) has resulted in the eviction and uprooting of many indigenous villages. It has also cut off these people from their life-supporting system. Further, many forestry projects were started which changed the character of the forests itself in such a way that they served exclusively commercial interests and no longer benefited the original forest-dwellers. Natural mixed forests on which they depended for their livelihood are being

clear-felled and replaced by plantations of teak, eucalyptus and various coniferous trees for commercial purposes. The large scale commercial exploitation of forests has not only destroyed the sources of livelihood of indigenous people but also adversely affected the ecology of the area.

In short, what we have in Singhbhum is organized loot by a few rich on one side and a situation of starvation of the majority on the other. The rich exploiters not only rob the indigenous people of their wealth but also treat them with contempt. They have no regard for the indigenous people's language and culture. They create division and tension among these simple peace-loving people through their machinations. They create communal hatred between the tribals and non-tribals of the area. The vested interests and communal forces have joined hands to break the solidarity of the indigenous people and to demoralize them. Towns like Jamshedpur, Chaibasa and Chakradharpur have become areas of communal tension. By converting this region into a fertile ground of communalism these forces are aiming to break the solidarity of the indigenous people in order to keep them in eternal bondage so that they can carry on their loot unopposed.

The result of this organized loot of the riches of the area is utter misery. Practically nothing has been done for the welfare of the villagers. Most villages are isolated and unapproachable due to lack of roads. Schools in many villages exist only on paper. Medical facilities are all but non-existent. As a result, the indigenous people resort to the only facility available to them—the witch doctors. Agriculture is the sole means of livelihood these poor people have. Due to frequent failure of rains the income from this source is also minimal. As a result, many have mortgaged their lands to the rich villagers and a large number have lost them to the mining contractors and become paupers and coolies in brick kilns. In such a situation of exploitation and perpetual starvation, disease, superstition and bondage plague their lives.

As a result of this systematic exploitation of the masses of indigenous people living in Singhbhum we have a situation which, using the words of the encyclical Rerum Novarum (No. 35) may be described as follows:

> On one side are the all-powerful rich; a faction in absolute control of industry and commerce, directing the flow of wealth entirely toward itself;... on the other side is the impotence of poverty, a vast multitude with bitterness corroding their souls, always on the verge of violence.

Thus although Singhbhum is developing at a very fast rate through the process of industrialization, mining and commercial exploitation of forests, its original inhabitants are among the worst underdeveloped groups in the whole country.

It is in this overall context of colonialist (internal) and capitalist exploitation of the wealth of this area that we have to consider the impact of the multi-million rupee Subamarekha Multipurpose Project, on the indigenous people of Singhbhum.

Subarnarekha Multipurpose Project

The Subamarekha Multipurpose Project (SMP) was first mooted in 1974 at an estimated cost of Rs 129 crores. Under this project, two major dams, two barrages and seven canals were approved for construction. One dam at Chandil and one barrage at Galudih are on the Subarnarekha river and one dam at Icha near Chaibasa and one barrage at Ganjia near Adityapur are on the Kharkai river, a tributary of Subamarekha. The seven canals will have a total length of 342 kms. The salient features of the project are given in Annexures III, IV and V. The escalation in the cost of the project has been quite high. It increased from Rs 357 crores in 1979 to Rs 480.9 crores in 1981-82. Now it is estimated that by 1994-95, when the project is expected to be completed, the final cost of the project would be Rs 1,005 crores. The project is financed by the World Bank.

According to an official report (1983) of the Irrigation Department, Government Bihar, the main objectives of SMP are the following:

1. to provide reliable water supply for irrigation of about 255,000 hectares of cultivable command area (CCA) in Bihar, Orissa and West Bengal;
2. to provide water for industrial and municipal use mainly in Singhbhum district in Bihar; and
3. to reduce flood damage in Orissa and West Bengal.

The report also says that there are good prospects of generating hydro-electric power to the tune of about 10 mw at 100 per cent load factor in the Subarnarekha left canal at Chandil dam. The present project, however, does not include any scheme for the generation of hydro-electricity.

SMP is a joint venture of the states of Bihar, Orissa and West Bengal. It envisages irrigation for about 1,60,000 hectares in Bihar (all in Singhbhum), 90,000 hectares in Orissa and 5,000 hectares in West Bengal.

A critical analysis of the declared objectives of SMP

Let us now look critically at these objectives and see what the real motive behind the construction of SMP is.

The primary objective of SMP, as stated by the report of the government, is irrigation. It is true that the total irrigated area in this district is very negligible, about 3.5 per cent of the total cultivated area. The vested interests are taking advantage of this weak point in tribal agricultural economy by spinning out a large number of bogus and real irrigation schemes under the shadow of which vast amount of public money is looted.

Today irrigation is the sole excuse for the existence of so many departments and projects in the tribal areas of Bihar, as for example, the Irrigation Department, Water Ways Department, Minor Irrigation Department, Bihar Hill Areas Lift Irrigation Corporation, various multipurpose dam projects, etc. In Singhbhum district, the Minor Irrigation Department alone, with five divisions, is maintaining a big establishment but as the Deputy Commissioner of the district stated recently in an interview (see Amrit Bazar Patrika, 28 August 1988), its performance in terms of providing irrigation water is too meagre to justify such a big establishment.

In the name of these departments and projects there is a virtual flood of employees, officers, contractors and their attendant parasites from outside the region. Crores of rupees of public money is spent in the name of constructing, maintaining and supervising various major, medium and minor irrigation projects. Besides these various departments, the Development Blocks also take up many smaller irrigation projects like constructing big-diameter wells, etc. These are done so unscientifically that almost all of them have become not only useless but also a big hazard to human and animal lives.

According to a reliable source, more than 50 crores of rupees have gone down the drain during the last several years in the name of irrigation projects in Singhbhum. Further, thousands of acres of good agricultural land belonging to the indigenous people have been laid waste because of these projects. It is estimated that on the average Rs 8 lakhs have been spent on each acre of land which these projects were supposed to have irrigated. In fact, according to the data given in the District Census Handbooks, the gross area irrigated in the whole of Singhbhum district has fallen from 1,02,244 acres in 1941 to 58,530 acres in 1980-81, i.e., a fall of 43 per cent. "There seems to be something wrong somewhere, for it is unthinkable that we should be sliding backwards with all our Five Year Plans", says the Census Handbook of 1961.

SMP intends to irrigate the tribal lands through a network of canals. Past experience has shown that canal irrigation is most unsuitable for this area which is very sloping and undulating. Further, the poverty of the tribal farmers and the fragmentation and scattering of their land holdings due to the peculiar partition system they have, makes it difficult and uneconomical for them to invest in pumpsets, etc. for pumping water from the canals.

Canal-irrigation in Singhbhum through SMP is sure to repeat the fate of another irrigation scheme, namely, the Roro Canal Irrigation Scheme situated near Chaibasa, the headquarter of the district. Under the pretext of this project, vast areas of good agricultural lands belonging to the tribals were acquired by the project officials from both sides of the canal. The surplus land was then leased out to the friends of the officials for some years. Now they are being used for building colonies for non-tribal officers and employees. Big walls have been erected on both sides of the canal as a result of which it is impossible for the tribals to take water from the canal for irrigation and other purposes. Most of the year there is no water at all in the canal. Some of the tribal farmers, now landless, have become coolies in Chaibasa bazar. SMP is only going to be an enlarged version of Roro Scheme at gigantic costs. It is one of the biggest frauds on the indigenous people of Singhbhum.

Another declared objective of SMP is flood control in West Bengal and Orissa. But merely to flood one area in order to control floods in another area is robbing Peter to pay Paul. It is gross injustice and no development at all. This is all the more so since the area to be submerged is inhabited by the most vulnerable sections of our population.

The real purpose behind the construction of SMP is not irrigation and flood control, but the expansion and strengthening of the colonialist and capitalist exploitation of the riches of this area. Singhbhum is one of the richest areas in the whole country, rich in minerals and forests. With the establishment of Tata Iron and Steel Company at Jamshedpur in 1907, a process of rapid industrialization and urbanization was started in this district for the exploitation of its riches. At present there are two major industrial zones in the district. The Dhalbhum industrial zone, situated in the Subarnarekha basin, has industrial centres at Jamshedpur and its adjoining areas of Adityapur and Kandra, Moubhandar, Mosaboni, Jadugora, Chakulia and Ghatsila. Most of the important metallic industries are situated in this zone. This area is bound to witness further rapid expansion of industries in the near future. The second major industrial zone of the district is South Singhbhum, where most of the mining industries are situated. The major centres of this zone are Noamundi, Jamda, Gua, Kiriburu and Jhinkpani.

Supply of industrial and municipal water to the many growing industrial centres in this mineral and timber rich tribal district is the real purpose of SMP. After the construction of SMP the whole of Singhbhum district is going to witness a very rapid and gigantic industrialization and modernization process for the exploitation of its natural and human resources. This process has already started with the beginning of the construction of a huge sponge iron plant by the Modi Group at Chandil. Large areas of tribal land are being acquired for this purpose. According to a report of the Irrigation Department, Government of Bihar, SMP is the seed for industrial development in Singhbhum. It says:

> Subarnarekha Multipurpose Project will be situated largely in Chotanagpur plateau of Bihar which is the major industrial district of the country rich in mineral resources with unlimited potential for further development. Already, industrial growth has reached saturation point due to constraint in industrial water and power supply. This project will provide new impetus to industrial growth by providing four lakh acre feet of water from Chandil reservoir for industrial and domestic use in its command area. Out of this, 3.5 lakh acre feet of water is earmarked for the twin cities of Jamshedpur-Adityapur and its adjoining areas. Generation of 50 mw hydro-electric power in the Subarnarekha Left Canal is under active consideration. Construction of the Subarnarekha Multipurpose Project itself will generate considerable demand for numerous engineering materials

and products which will be supplied by the industries situated in its command. . . When this project will be commissioned and 5,70,000 acres of land will be brought under its command, the present cropping intensity at the pathetic level of 0.6 will be enhanced to 1.6. This will provide further boost to the industries in the form of agricultural inputs, viz., fertilizers, pesticides, pre-and-post harvesting agricultural implements, storage and marketing facilities, communication and transport network. (Quoted in Fernandes 1985: 2).

In short, there will be an industrial explosion in Singhbhum. We can call it an 'explosion' because of the totally unparalleled scope and the catastrophic nature of the change that it will bring about in this region. There will be an unprecedented assault on the relatively stable and self-sufficient indigenous people and their land and other resources. It will not only mean a further dispossession of their sustainable resources but it will also lead to their brutal displacement and pollution and degradation of their environment.

SMP will also bring about a sort of 'green revolution' in the command area of the project. As one writer wrote in the daily, The Indian Nation (4 September 1981), "The Subarnarekha project is going to transform its command area into a virtual 'gold-yielding' region". Agriculture will be commercialized and as in Punjab the ultimate beneficiaries of this 'green revolution' will be a small group of rich capitalist farmers.

SMP is already causing a tremendous influx of outsiders to Singhbhum . The various benefits arising out of the project are being taken away mostly by these outsiders. The indigenous and displaced people are given only unskilled and exploitative jobs.

The arguments given by the government in support of SMP really masks the unequal distribution of social benefits arising out of this project. The declared multipurpose nature of SMP, which is seen as supporting irrigation and industry, is largely illusory, since these two functions are competitive rather than complementary. The timing of the release of irrigation water is as important as volume, and the demands of industry are not the same as those of the indigenous farmers. Since SMP will be controlled by the dominant industrial interests rather than by the farmers, it is the needs of the largely urban-industrial consumers rather than those of the indigenous rural agriculturalists that will take precedence. The indigenous people, in effect, are being sacrificed on the altar of India's industrialization and modernization.

Impact of SMP on the indigenous people

Though the project report of the Irrigation Department, Government of Bihar paints a rosy picture regarding SMP, it fails to impress the indigenous people of Singhbhum, the ones most affected by the project. They consider the project as a curse rather than a blessing and they are resisting it in many different ways. Let us look deeper into the impact of SMP on the indigenous people of Singhbhum in order to understand the reasons for their resistance.

A. Dispossession of indigenous people

The situation facing the indigenous people of Singhbhum due to the construction of SMP is the same as the situation of indigenous people all over India who are faced with similar development projects. The basic phenomenon that characterizes their situation is **dispossession**. They are systematically and methodically being dispossessed of the ownership of their means of production, of the product of their labour, and of the very means of human existence. They are dispossessed of their culture, their values and their very identity and their communities are being broken up in the name of 'progress' and 'national interest'. Let us now see how the construction of SMP is leading to the dispossession of the indigenous people of Singhbhum in the various spheres of their life—economic, social, political and cultural.

1. Dispossession of land

The price that the indigenous people of Singhbhum will have to pay for the project in terms of their ancestral land, to which their entire life is very closely linked, is enormous. For the construction of the two dams, two barrages, seven canals having a total length of 342 kms, 712 kms of roads, and for the many colonies for housing the officers and other employees (mostly from outside) of the project, vast areas of land belonging to the indigenous people are being acquired by the government. According to the project report on land acquisition and survey (April 1985), for the Chandil dam alone a total of 43,500 acres of land will have to be acquired. The details of the type of land and the amount that will be submerged due to the Chandil dam reservoir are as follows:

The type of land	Amount in acres
Homestead land	291.34
Cultivable land	27,076.88
Raiyati (culturable waste)	
Government land	12,775.55
Forest (Forest Department)	2,969.57
Indian Railways	382.90
	43,496.94

Source: Project Report on Land Acquisition and Survey (April 1985).

The Icha dam reservoir in Kharkai will cover a total area of 21,000 acres in Singhbhum and 10,500 acres in Orissa. The two canals emerging from this dam will cover 58,700 acres in Singhbhum and 1,52,100 acres in Orissa (Huq 1982: 16). No information is available regarding the amount of land that will be acquired for the other five canals, the two barrages, for the construction of roads, and for the colonies. Large areas of Gairmazarua lands all over Singhbhum are being taken over by the government and colonies are being constructed there to house the project personnel and their families who are almost all from outside Singhbhum. These Gairmazarua lands are the common property of the indigenous people on which they graze their cattle. Due to the building of these colonies the indigenous people are deprived of these common property resources. Further, about 10,000 acres of forests on which the indigenous people depend for their livelihood, will be wiped out because of the project.

Acquisition of excess land: The Chotanagpur Tenancy Act (CNT) prohibits the alienation of tribal land to non-tribals. Inspite of the restrictions given in the CNT Act large areas of tribal lands are being legally and illegally alienated by the vested interests. The state and its administration instead of protecting the poor tribals have become a major party to these alienations. The CNT Act is being subverted by employing the wide-ranging Land Acquisition Act on the basis of which tribal land could be acquired for 'public use'. The term 'public use' in this Act is so broad that it could be used to sanction land for practically any purpose.

One of the main ways of alienating tribal land in Chotanagpur is illustrated by the following account. The government sanctions a new project like an irrigation scheme on construction of experimental farms. In the name of this project for 'public use' a large area of tribal land, much more than what is actually required for the project, is acquired by the administration. The excess land is then leased out to the friends of the officials and politicians. The project itself usually collapses within a few years and the whole land is given out for other purposes. The best example of such alienation of tribal land is seen in the case of Roro Irrigation Scheme near Chaibasa about which we have already mentioned.

This method of circumventing the CNT Act and alienating tribal land is used in SMP also. In fact SMP has given a golden opportunity for the vested interests to alienate large areas of tribal land in Singhbhum. For example, in the name of flood control, a vast area of tribal land is being acquired for the Chandil Dam. This dam is supposed to have a provision for 10 feet of water for flood cushion. This might submerge a large tract of land just for a few hours or for a maximum period of 24 to 48 hours during the year (Jha 1981). Supposedly for this purpose the authorities are acquiring vast areas of extra land (more than 37,500 acres) belonging to the tribals. According to the project authorities they will lease out such submergable land to original owners themselves. Past records, however, show that such lands will be used for other purposes or leased to those who can grease the palms of the officials and politicians. Further, if these lands are going to be leased out to the original owners, then there is no need of acquiring them from these people. In order to prevent this kind of subversion of the CNT Act there should be provision in the Land Acquisition Act that if the acquired land is not used for the specified purpose, then it should be given back to the original owners. Also acquiring of excess land for any project and afterwards leasing it out to others should be stopped.

The above facts show that the indigenous people of Singhbhum will be dispossessed of vast areas of their ancestral land in the name of Subarnarekha Multipurpose Project.

2. Displacement of people

The Chandil reservoir will submerge 32 villages fully and 84 villages partially in Chandil, Nimdih and Ichagarh blocks displacing a total of 6,773 families. The details of families that will be displaced are as follows:

Type of families	No. of households
Harijan families	444
Adivasi families	1,791
Scheduled tribes/castes	4,164
Others	374
Total	6,773

Total number of people that will be displaced—37,600.
Average number of persons per family—5.5, i.e., 5 or 6 persons.
Source: Project Report on Land Acquisition and Survey (April 1985). (Quoted in Fernandes 1985: 4)

Nearly 95 per cent of the displaced families belong to Scheduled Castes and Scheduled Tribes. Further, it should be noted that since the survey work in some areas is not yet complete the number of families to be displaced would be much higher.

Due to the construction of Icha Dam on the Kharkai river in the Kolhan area 21,000 acres of settlement will be wiped out. In effect, 20 villages will disappear completely from the map and 41 villages partially in Chaibasa, Tantnagar and Rajnagar blocks, displacing 5,600 families. The number of families that will be displaced due to the construction of barrage, canals, roads, colonies, etc. is not yet known. Most of the families affected by the Icha Dam belong to the Ho tribe. The Hos form the majority in Kolhan. In fact Kolhan is also known as Ho disum or the land of the Hos. Because of the construction of Icha Dam the Hos will be the worst affected indigenous group. As one writer has put it, the Kharkai dam will destroy the very character of Kolhan (Raj A. 1985: 4). Kolhan will no longer be Ho disum. Hos will be either driven out or reduced to a minority in Kolhan due to the flooding of outsiders into this area caused by the Kharkai Dam. As their ancestors have done in the past under the pressure of this tremendous onslaught from the alien forces, the Hos are gradually retreating to the forest areas, especially to the rich Saranda forests, or moving southwards to Orissa. The jangal katai andolan (forest cutting movement) of the last few years is a sign of this

movement. If Saranda is to be saved from destruction, then Icha Dam must be stopped at once. Since there is not much forest left to be cut, this avenue is also almost closed for the people. Many of their brethren have left their homeland and gone to the brick kilns and stone quarries of North Bihar, UP, and other places in search of livelihood. The entire Subarnarekha Multipurpose Project will thus cause a massive movement of people—of outsiders into Singhbhum to take advantage of the economic opportunities that are opened up and of the displaced and dispossessed indigenous people out of Singhbhum in pursuit of means for their survival.

3. Inadequate compensation

The policy of compensation adopted by the government is very unjust and inequitable. The displaced people are being paid for their land and house only. Further, the compensation is given in monetary terms. In the beginning the rate of compensation fixed by the government was very low. Since sale of land is not competitive and free in Chotanagpur compensation should be worked out on the basis of yield in the various projects. In the past, very low compensation, sometimes as low as Rs 200 per acre, had been paid on the basis of sale deed patta. After long struggle and protest by the people the rate is raised and now it varies from Rs 5,000 to Rs 30,000 per acre depending on the type of land. The classification of land is done on the basis of yield and land tax tokens are taken as indicators of quality of land. In the past many families for the purpose of reducing land tax had registered high quality lands as low yielding third grade lands. Since compensation is paid on the basis of tax tokens, they are getting a smaller amount than they should get for their land.

Although the rate has been raised, the actual compensation paid is much less than the promised rate. For example, at villages Chaliama, Bankasai and Tolai altogether 22.63 acres of land were acquired after paying a compensation of Rs 88,406. This works out to be Rs 3,484 per acre. Again in village Kesargadia 406 acres were acquired from 303 land owners after paying a sum of Rs 5,71,771 which works out to be Rs 1,408 per acre (Raj A. 1986: 8-9).

For the indigenous people monetary compensation has very little value. First of all, it is very meagre and inadequate for their rehabilitation as they will not be able to buy land in other places at the prevailing high rates. The price of land has also shot up because of the demand for land by displaced people. Secondly, since the only skill they have is farming, they will not be able to put the money for any commercial use. They will either eat it up or will be swindled. Since most of them are illiterates, they are being cheated even by the officials who make the payments. Many reports of bribes taken by the officials have come in the press. Again, cash compensation is paid only to those who can stake a claim for land ownership. Having resided in and around forests and vacant lands for centuries, many have no proof of legal ownership. According to a report appeared in Amrit Bazar Patrika of 9 March 1986, more than 100 adivasi families belonging to the Savar and Kharia tribes in village Bedia who had been living there for more than half a century were served with a government notice to vacate the place or to face penalty under Bihar Public Land Eviction Act, 1956. Their land was given to SMP for construction of 100 residential quarters for its officials and employees. The poor adivasis were literally thrown out of their land by the construction authorities. No compensation was paid to them as they were supposed to be living on public land.

Cash compensation has also created mistrust and division in many families who were otherwise living peacefully. Some 'clever' and stronger members of the families have fraudulently deprived the weaker ones like widows, old women, etc. of their rightful compensation and misappropriated it for themselves. This was done in connivance with the officials who were given bribes for such illegal acts. This has set a trend and now even others are asked to pay bribes for processing their complaints. One old woman who was deprived of her rightful compensation went on hunger strike before the Project Office for several days.

As far as the indigenous people are concerned, cash compensation is not only inadequate but practically useless in the long run. What they need is cultivable land for their suvival. In a confidential report sent to the government of Bihar regarding SMP and the atrocities committed on adivasis, the Tribal Welfare Commissioner, Ranchi wrote the following:

> As regards the government policy of rehabilitation, it is essential to include the settlement of agricultural land within the parameters of the rehabilitation programme. There is no doubt that the tribals' demand for settlement of agricultural land is genuine as they are mainly agriculturists and without land they are doomed. Therefore, it is essential to settle economic holdings (2.5-5 acres) of agricultural land with each displaced family. The displaced families can be settled on government land or degraded forest land (made fit for cultivation) or some land of big cultivators that could be acquired in the proposed command area. Compensation in the form of money will not suffice to rehabilitate them. (Basant 1983).

A study made by Paul Fernandes of the Xavier Labour Relations Institute, Jamshedpur on the rehabilitation programme of SMP, points out that for effective rehabilitation,

> the provision of one acre of agricultural land with irrigation facilities so that at least two crops can be cultivated, or two acres of cultivable land so that at least one crop during monsoon can be cultivated is the minimum required. It is a must. Whether it will be provided or not depends on the government and not on the "availability" of land. While "land not available" seems to be an easy loophole oft resorted to, it should not be exploited or the seriousness of the matter undermined by elusive phrases like "efforts will be made", etc. If land could be acquired in such large measure for purposes of creating reservoirs, constructing railway lines, canals, for reforestation, for factories, for building housing colonies for project personnel, etc., it can also be acquired for rehabilitation. . . Besides, land is "available" with large farmers, with the government, and with the forest department. It is a question of acquiring it for rehabilitation. (Fernandes 1985: 39).

However, there is absolutely no effort shown from the side of the government to provide adequate land to the displaced for their survival. The position of the ruling capitalist in this regard may be gauged from an interesting footnote on page 2 of David Selbourne's An Eye to India recording "the views of the Deputy Managing Director of the Metal Box Company in Calcutta, that 'one third of India's population (sc. 200 million)' was 'hopeless', and 'would have to be exterminated if the other two-thirds was to survive'."

4. Rehabilitation—No appropriate programme

The 10-point programme of rehabilitation announced by the state government is as follows: follows:

1. 0.25 acres of homestead land will be given free of cost; or if land is not desired by some, for them its value will be given; or in the case of non-availability of land they will be given 0.125 acres of land and compensation will be given for 0.125 acres.
2. Rehabilitation work will be completed along with the project construction work.
3. Priority will be given to the displaced people in the appointment of fourth grade employees in the project. And at least 50 per cent of the third grade positions will be given to displaced people.
4. Every household will receive Rs 75 as grant-in-aid. And those who receive compensation below Rs 2000 will be given Rs 500 additional grant-in-aid.
5. Where more than 20 to 30 families are rehabilitated, they will be given school, hospital, road, pond, community hall, toilets, playground, park.

6. Government land will be made available for rehabilitation.

7. Suitable persons will be selected and given training as machine operators, masons, carpenters, blacksmiths and other vocational training will be provided.

8. Employment centres and technical institute will be opened.

9. To prevent the misuse of compensation, displaced people will be given bank facilities.

10. Places of worship (temple, mosque) will be built and given to those displaced people in whose village such facilities existed before their evacuation. Also irrigation, electricity, cooperatives, etc. will be provided. (Quoted in Fernandes 1985: 5).

The future that is set before the 12,000 and more families comprising more than 75,000 indigenous people, to be displaced by SMP is in reality very bleak. In fact, even now most of them do not know where they will go. Even though minute details have been worked out for the construction of the dams and for the construction of the quarters for those (mostly from outside) who are going to be employed in the project, practically nothing has been done for the proper rehabilitation of these 12,000 and more families. Recently many reports have appeared in the press regarding the miserable plight of those displaced from the Chandil Dam site.

The programme of rehabilitation announced by the government does not take into proper account the cultural values, the experiences and the very survival needs of the people to be displaced. It will result in the destruction of their identity and in their ultimate pauperization. Paul Fernandes, in the conclusion of his study, stated the following regarding the above rehabilitation programme:

> The findings of the research give ample evidence that the change as directed by the rehabilitation programmes will not lead to development of at least about 75 per cent of the households displaced, and it does not even guarantee meaningful existence to at least 50 per cent of the households. This finding is further supported by an analysis of the actual plan drafted by the authorities for rehabilitation. (Fernandes 1985: 89).

5. Employment to the displaced—false promises

The promise of providing employment to the displaced families is the most deceiving aspect of the whole rehabilitation programme. It is true that the project will open up lot of employment opportunities. Regarding the employment potential of the project during the construction period an official report says thus:

> The project will provide substantial employment opportunities. During the peak hours of construction there will be 500 engineers on the job. During the peak hours of construction extending in a period of four working seasons, about 13,000 skilled workers and 70,000 unskilled workers will be employed between October and June every year to complete the project. (Government of Bihar 1983).

After the construction, however, the number of people permanently employed in the project will not be many. But the important question is, will the displaced people be able to benefit from these employment opportunities opened up by the project? The government has promised that priority will be given to the displaced people in the appointment of fourth grade employees and at least 50 per cent of the third grade positions will also be given to them. This is the promise. What is the reality? Let us look at some facts. The detailed study made by Paul Fernandes shows that the percentage of displaced people employed in the project as fourth grade employees is less than 10 per cent of the jobs available and in the third grade the percentage employed is less than five per cent. (Fernandes 1985: 23). Further, he says:

The percentage of people employed in the fourth grade from Singhbhum district is also below 10 per cent and those in third grade is below 5 per cent.

And to cap it all, no one from among the displaced people or from among the people of Singhbhum district, is employed in the Grade II category of employees or as officers, engineers, etc. The case of displaced persons is understandable because they will not be qualified with or without training. But in Singhbhum district, which has 29 per cent literacy, which is about four per cent higher than the national average and about nine per cent higher than the average for Bihar, and which has colleges, technical institutes, management institutes, industries, etc., that we do not have qualified people to work as grade II employees or as officers, is unbelievable and beyond comprehension.(Fernandes 1985: 23).

The number of displaced people actually employed in jobs like earth cutting, loading, carrying, is also not many. Such works are given out to the contractors by the principal employer SMP. The contractors prefer to employ workers from outside so that they can exploit them to the maximum extent. Even child labourers are employed by these contractors. During a surprise visit of the Asanboni site of SMP Mr KP Singh, MP found out that more than 20 per cent of the 200-odd labourers employed in that site were children. All of them were brought by the contractors from Orissa. At the time of their coming each of the labourers was paid Rs 550 in advance. After that everyday they were given 1,100 grams of rice and 50 paise for vegetables. No payment either weekly or monthly was made to them. Many reports have come up in the press regarding the exploitation of workers in SMP and non-employment of displaced and local people.

At the same time large numbers of families of permanent employees from outside, mostly from North Bihar, have come and settled in various parts of the district. The dam site at Chandil looks like a big township with 2,000 quarters for employees and for their needs. Big colonies have also come up at Ghatsila, Ganjia, Icha, Chaliama, Chaibasa, Ranagar and other places, to house the various employees of the project.

The following report appeared recently in the press, showing that the promises made by SMP authorities regarding rehabilitation, compensation and employment are a mere eye-wash and do not correspond to actual performances:

Over 30 per cent families, displaced by the execution of the Rs 983.2 crore inter-state Subarnarekha Multipurpose Project (SMP), have been neither rehabilitated nor were provided any compensation, reports PTI.

According to a House Committee report of the Bihar legislative council, a large number of affected families were not even included in the list of displaced families. In several cases compensation was given through middlemen resulting in 'grave anomalies' in payment.

Over 47,000 acres of land were likely to be submerged due to the execution of the Subarnarekha Dam at Chandil in Singhbhum district of south Bihar. The number of fully and partially submerged villages was 32 and 58 respectively, the report said.

The report said the government's policy of providing employment to educated unemployeds, displaced by the project, was not adhered to.

As per government policy, all educated unemployeds were either to be absorbed in the project or were to be provided alternative employment. But outsiders were being employed in the project ignoring the interests of the sons of the soil, it said.

Besides, the land acquired for rehabilitation was not being properly developed for human habitation. Communication facilities, water and power supply were also inadequate making the displaced families disinterested in shifting to the rehabilitation colonies.

The report said that the compensation amount was inadequate. Besides, no satisfactory arrangements were being made for providing employment to the displaced farm labourers, although training was being imparted to a few. (Amrit Bazar Patrika 10 August 1988).

The facts and analysis given above show how the indigenous people of Singhbhum are brutally being dispossessed of their sources of living by the various programs and policies adopted and implemented (or non-implemented) by the authorities concerned, such as the program and policies for land acquisition, compensation, rehabilitation and employment. We have also seen that the gigantic industrialization process that will be accelerated by SMP will lead to the ultimate pauperisation of the indigenous people of this area.

B. Dispossession in social, political and cultural spheres

The dispossession of the indigenous people of Singhbhum due to SMP and other development projects is taking place not only in the economic sphere but also in the social, political and cultural spheres. As a result of the new forces that are being introduced among them and also due to the rapid change that is taking place in their economic condition the social structures of indigenous societies are also breaking down. Their family life is getting disrupted. They are losing their traditional social controls and social tension is increasing among them. They are becoming more and more vulnerable to disease and emotional disorders. Many indicators of social anomalies such as alcoholism, crime, suicide, prostitution, delinquency and despair have gone up suddenly. Further, these people, confronted with development and modernization, are often experiencing a loss of self-esteem. They are feeling a deprivation of their sense of personal worth and a devaluation of their social identity. This feeling is further aggravated by the negative attitude and approach of the dominant society towards their culture. As a result of this continual and systematic process of dispossession and disruption of their society the indigenous people of Singhbhum are gradually being reduced to a sub-human level of existence.

Big dams are symbols of power for their protagonists, power to control the lives of others. Construction of big dams and other irrigation projects in areas where the indigenous people are dominant is one of the most important political instruments used by the vested interests to break the solidarity of these people and to keep them in eternal bondage. It is extremely important to understand this political significance of big dams and to recognize also the breadth of vested interests involved in such big dam projects.

The political significance of big dam projects lies mainly in the fact that they enable the vested interests to have centralization control by having control over water management, agriculture, resettlement of the displaced, pattern of employment, in short, over every aspect of the lives of those affected. Community control over water management is replaced by bureaucratic control. The cropping pattern served by the new irrigation schemes is determined mainly by the industrial and urban interests. It follows the green revolution model and as such relies on centralized technology, inputs and knowledge systems. The political context of big dams construction is thus one of opposition of the interests of the few haves and those of the many have-nots. (Hirsch 1988: 8-9).

The dispossession of the indigenous people in the political sphere is achieved through political integration which results in the destruction of their traditional political institutions. They have to conform to and become integrated with the political institutions of the dominant society where political authorities belonging to the dominant society are appointed over them. As a result of all these they become politically powerless and are marginalized and exploited by the dominant society.

Because of all the above factors the cultures of these societies are also gradually disintegrating, a process further accelerated by deliberate programmes of forced cultural modification designed and executed by the state and its agencies.

Every area of their life from language to marriage, customs and religion have come under attack. Language is the main cementing factor that expresses the identity of a given community. There is a non-declared policy to suppress the languages of the indigenous people and to impose on them the dominant language of the area. According to a well known Indian sociologist, the tribal languages are "merely corruptions of good speech and unworthy of survival". (Ghurye 1963: 187).

The dispossession of indigenous people that is taking place in the economic, political and social spheres has an adverse impact on their religious system, which is closely linked to their socio-agrarian system. The new forces of change that have come up are beyond its framework. Together with the influx of outsiders, a hoard of foreign bongas (evil spirits) have also invaded their country. The propitiation of these bongas has almost ruined them financially. The inevitable frustration resulting from this continued deprivation finds expression in the formation of new forms of religions, revitalization of movements and various messianic movements. The writer of this paper, for example, has been able to collect information on more than 15 new religious movements among the tribals of Singhbhum alone which indicate the turmoil that is taking place in their society.

C. Proletarianization and enslavement of indigenous people

We have seen that Singhbhum district is one of the richest areas in the whole country, rich in minerals and forests. At the same time it is also the homeland of large groups of indigenous people. Further, in the name of 'national interest' this district is witnessing a gigantic industrialization process for the exploitation of its natural wealth. This philosophy of national interest (which is nothing but the interest of the ruling capitalist class) is the guiding principle behind the process of development that is taking place in this area. In other words, in the name of development the indigenous areas are witnessing not development but the 'rape' of its people and its natural wealth through a process of colonialist (internal) and capitalist exploitation. The brutality displayed on the land and the people of this area by the process of industrialization, by the plundering of its mineral wealth, and by the decimation of its forests which provided much of the livelihood for its people, has not only reduced the majority of its inhabitants to destitution but also brought the area to the brink of an ecological disaster.

The large scale capitalist exploitation of the wealth of Singhbhum requires a vast army of cheap labour. The indigenous people of Singhbhum are forced to accept this role of casual wage labour in industry, mining, forestry and other operations. The capitalist development and exploitation is thus operating in a vicious circle. On the one hand it creates destitutes through eviction, destruction of their sources of livelihood, etc. and on the other hand it utilizes their destitute condition to employ them for a specific role in this process, viz., that of sweat-labour or proletariat. Every attempt is made to keep them in such a situation because without them remaining in such a state no 'development' is possible. Thus they typify the following liberalist view quoted by Thomas P Neil (1953: 86):

> Without a large proportion of poverty there could be no riches, since riches are the offspring of labour, while labour can result only from a state of poverty. . . Poverty, therefore, is a most necessary and indispensable ingredient in society, without which nations and communities could not exist in a state of civilization.

Another liberalist wrote:

> Everyone but an idiot knows that the lower classes must be kept poor, or they will never be industrious. (Neil 1953: 56).

Thus poverty and the poor are absolutely essential for the very survival of the system which is existing in our country.

SMP and the proletarianization of the Singhbhum's people

The first step in this process is the disassociation of the indigenous people from the ownership of their means of production, especially from their land. SMP will alienate more than 75,000 acres of land for the two dams alone, displacing more than 12,000 families comprising about 75,000 people. As a result their subsistent and self-sufficient economy will be destroyed. They will be turned into "free workers" independent from and deprived of the material means of their own reproduction. For their survival they will have to depend soley on their labour power. This conversion of self-sufficient farmers into cheap wage labourers is the first pre-condition for the spread of capitalist mode of production.

The second step in this process, is the creation of 'labour colonies'. This is achieved through the resettlement and rehabilitation programmes adopted by the government. The displaced people are being settled in groups on government and other lands and each family is being provided with 0.25 acres (if sufficient land available) or 0.125 acres of homestead land freely. This small plot of land is given so that they can undertake subsistence production when they are not needed as wage labourers. This helps to keep the labour force cheap since by cultivating the small plot of land the workers obtain part of their own consumption needs. In this way a vast army of cheap labour force is "conserved" and the permanent availability of its labour power assured.

The third step in the proletarianization of indigenous people is their "disciplining" and training. For the capitalist exploitation of the area it is necessary to create a particular class of workers out of the indigenous people. They have to be "disciplined" and trained for the type of work (as rejas and coolies, for example), they have to perform, because indigenous people in general are neither willing nor prepared to work as wage labourers. The rehabilitation programme has, therefore, various provisions for achieving this purpose (e.g. Nos. 7 and 8 of the rehabilitation programme given above).

In this way, the indigenous people of Singhbhum are gradually being reduced to proletariats by the SMP. They are systematically and methodically being dispossessed of the ownership of their means of production, of the product of their labour and of the very means of human existence. This systematic dispossession is resulting in starvation, squalor, disease and deprivation. Regarding the enslavement and degradation of the indigenous people of India, Nirad C Chaudhuri, the provocative analyst of the Indian social scene wrote thus in his book, The Continent of Circe:

> In an industrialized India the destruction of the aboriginal's life is as inevitable as the submergence of the Egyptian temples caused by the dams of the Nile. . . As things are going there can be no grandeur in the primitive's end. It will not be even simple extinction, which is not the worst of human destinies. It is to be feared that the aboriginal's last act will be squalid, instead of being tragic. What will be seen with most regret will be, not his disappearance, but his enslavement and degradation. (Quoted in Haimendorf 1982: 312).

D. Resistance by indigenous people and government response

There has been growing resistance to the construction of SMP right from its beginning when the survey work on the project began at Chandil. Realizing its adverse impact on their society the indigenous people of Singhbhum began to organize themselves against the project. On 27 March 1975 they besieged the Chandil block office demanding that the Subarnarekha

project be altogether dropped. However, during the Emergency, work on the project started in full swing. The villagers were issued notices to vacate their land for the projcet. They sent several petitions to the prime minister and other ministers and high officials but in vain. At last on 26 March 1978 they organized a one-lakh strong rally which proceeded from Chandil to the dam site and ended in a public meeting. During this meeting a decision was taken to launch a mass fast-unto-death programme from 23 April for the fulfilment of a seven-point charter of demands.

The programme of fast unto death duly began on 23 April near the Jaida PWD dak bungalow at Chandil. On 29 April the police raided the satyagraha camp and arrested the satyagrahis. Some of them were severely beaten up. The people reacted strongly to the police repression and on the following day some 8,000 people including women and children gathered at the camp site determined to go on fast. In order to disperse the crowd the police first burst tear gas shells and then fired at the crowd indiscriminately. At the end of the police action four people had died, one of them being bayonetted to death.

There was similar resistance by the indigenous people against the construction of the Icha Dam in the Kolhan area and the repression by the government was also ruthless. The struggle of the people centred around the demands of land for land, higher rate of compensation, proper employment to the displaced, etc. For example, the tribals of village Bita in Rajnagar block were demanding proper compensation for their lands which were being acquired for the project. On 22 March 1982 at about 4 O'clock in the morning 11 truckloads of armed police raided the village and surrounded the house of Sidiu Tiyu who was leading the struggle. They looted and destroyed his house and the inmates who objected were beaten up. When other villagers, mostly women, protested against this inhuman act they were also beaten up. After this another party of armed police came and destroyed the house of Sura Purty. His belongings were also taken away. When Sura's sister and his old mother tried to stop the police, both of them were beaten up. Sura's mother fell unconscious. This barbarous act of the police was condemned in the state assembly.

The most inhuman and brutal of all these atrocities was the killing of Gangaram Kalundia in police custody. Kalundia was an ex-army man who had won the president's award for bravery during the 1965 war. After his retirement he was organizing the people of his area under an organization called the Kharkai Bandh Sangarsha Samiti, for getting just compensation for their land which was to be acquired for SMP. Without making any proper arrangements for their rehabilitation the government was trying to forcibly take away their land. As Kalundia was leading the movement against this unjust eviction, the police raided his village on 4 April 1982 and shot him on the thigh and looted his house. The wounded Kalundia was taken in a truck to Chaibasa. Instead of taking him to a hospital the police took him to a lonely place further away from Chaibasa. There he was severely beaten up and finally shot dead. When the villagers got back Kalundia's body, they found that his body had bayonet wounds and his private parts were missing. An FIR was lodged by Kalundia's wife in the local thana but the officer in charge refused to accept it. The Tribal Welfare Commission, Ranchi made an inquiry of this incident and sent a confidential report to the government asking for CBI inquiry. But upto now nothing has been done to punish the guilty officials.

The Tribal Welfare Commissioner's remarks concerning the irrelevance of big dams in this area are worth paying attention to. In 1985 the local member of parliament, along with a number of village headmen had forwarded a memorandum to the then Prime Minister Mrs Indira Gandhi urging her to cancel this scheme. A case filed by the Kisan Panchayat of Domardiha against the construction of Icha Dam is still pending in the Supreme Court of India.

Also there are many other struggles by the indigenous people of this area under the leadership of various political and other groups like the Jharkhand Mukti Morcha, Kolhan

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Raksha Sangh, Jharkhand Mukti Andolan, Icha Kharkai (Purvi Kolhan) Vistapit Sangh, against the various types of exploitations going on in the SMP. Instead of having a sympathetic understanding of the problems of the indigenous people and trying to solve them through a process of dialogue with them, the state's reaction against these struggles has been one of increased repression.

E. Alternatives to SMP

It is important to remember that there are alternative systems of irrigation which are very suitable for this area such as tanks, reservoirs, ahars, which are less expensive and are based on traditional knowhow and people's participation but which are not encouraged. They have a proper watershed perspective for water management. The big irrigation projects look at the problem of watershed management by starting at the bottom of the watershed rather than where the rain falls, that is at the top. Traditional systems of water management, notably the tank and reservoir systems popular among the indigenous people, take an opposite approach, focusing on small scale works that are integrated from the top of the watershed downward.

Such alternatives require a reversal of the entire planning process whereby each village becomes a unit, and decisions regarding its development are made by the people, taking the resources provided by the ecosystem into account. Development and protection of the environment will then proceed hand in hand, and industrialization will grow in response to people's needs.

Conclusion

In this paper we have seen that Singhbhum is a very rich district, rich in minerals and forests. It is also the homeland of a large group of indigenous people who live in harmonious relationship with their environment. Further, we saw that in the name of 'national interest' Singhbhum is witnessing a gigantic industrialization and development process for the exploitation of its natural and human resources. This capitalist form of development is leading to the large scale dispossession and proletarianization of the indigenous people of this area. The Subarnarekha Multipurpose Project will accelerate this process and will lead to the ultimate pauperization and enslavement of the majority of the indigenous people of this district.

REFERENCES

Basant, Sunila. Confidential report No. 1247 sent to the Commissioner and Secretary, Home Department, Old Secretariat, Bihar, Patna, dated 5 June 1982. This report was filed in the Supreme Court of India in connection with Writ Petition Nos. 371-75 of 1983.

Bodley, John H, **Victims of Progress** (California 1982).

Dalton, ET, **Tribal History of Eastern India** (Delhi: Cosmo Publications, 1973, reprint).

Fernandes, Paul, **Subarnarekha Multipurpose Project: Towards Evolving a Strategy for the Management of Displaced Families** (Jamshedpur: XLRI 1985).

Ghurye, GS, **The Scheduled Tribes** (Bombay: Popular Prakashan 1963).

Government of Bihar, Irrigation Department, **Subarnarekha Multipurpose Project.**

Haimendorf, Christoph von Furer, **Tribes of India: The Struggle for Their Survival** (Delhi: Oxford University Press 1982)

Hirsch, Philip, "Dammed or Damned? Hydropower versus People's Power", **Bulletin of Concerned Asian Scholars**, Vol. XX, No. 1, 1988.

Hunter, WW, **A Statistical Account of Bengal**, Vol. XVII (Delhi; Concept Publishing Company 1976, reprint).

Huq, Masoodul, "How the police killed a war hero", **Sunday**, Vol. IX, No. 49, 23-29 May 1982.

ILO, **Report of ILO-Convention**, 1957 (No. 107) (Geneva, 1-10 September 1986), Meeting of Experts on the Revision of the Indigenous and Tribal Populations (Published by AK Kisku, Calcutta 1987).

Jha, IM, "Subarnarekha project to have two barrages", **The Indian Nation** (4 September 1981).

Neil, Thomas P, **The Rise and Decline of Liberalism** (Milwaukee: 1953).

Raj, Aloysius, "Kharkai Bandh ban jane se Kolhan ka astitva hi mit jayega", **Singhbhum Ekta**, Vol. VIII, No. 10, 21 December 1985.

Raj, Aloysius, **Stop the construction of the Kharkai dam in the interest of tribals and nation** (Chaibasa: Tribal Documentation Centre, year unknown).

Roy Chaudhury, PC, **Bihar District Gazetteers, Singhbhum** (Patna: 1958).

ANNEXURE I

Population of Singhbhum in 1872 classified according to major indigenous groups

Indigenous groups	Total population	Percentage of total population
Kol	1,50,925	36.36
Santal	51,132	12.32
Bhumij	37,253	8.98
Goala	36,320	8.75
Tanti	20,758	5.00
Kurmi	19,667	4.74
Bhuiya	12,078	2.91
Kamar	7,959	1.92
Kumhar	7,145	1.72
Gond	4,383	1.17
Ghasi	3,976	0.95
Teli	3,904	0.94
Munda	3,877	0.93
Kharwar	3,872	0.93
Sunri	3,274	0.79
Tamaria	3,016	0.73
Dhoba	2,096	0.50
Dom	2,054	0.49
Other indigenous groups	23,163	5.58
Total indigenous population	3,97,307	95.73
Total population of Singhbhum	4,15,203	100.00

ANNEXURE II

Population of Hos, Santals, Mundas and Bhumij and their proportion to the total population of Singhbhum during various census (1872-1971)

Year	Total population	Hos	Santals	Mundas	Bhumij
1872	4,15,023	1,50,925 (Kol) (36.37)	51,132 (12.32)	3,877 (0.93)	37,253 (8.98)
1901	7,54,658	2,69,035 (Kol) (35.65)	98,185 (13.01)	N.A.	N.A.
1931	11,16,424	3,38,827 (30.35)	1,40,110 (12.55)	57,450 (5.15)	66,846 (5.99)
1941	13,50,141	3,83,421	N.A.	N.A.	N.A.
1961	20,49,911	4,53,988 (22.15)	2,17,574 (10.61)	1,18,932 (5.80)	98,518 (4.81)
1971	24,37,799	5,03,440 (20.65)	2,65,536 (10.90)	1,38,043 (5.65)	1,23,109 (5.05)

Note:

1. Figures in brackets give the percentage proportion to total population.
2. The term 'Kol' includes besides Hos some Mundas and Oraons also.
3. Figures given for the years 1872, 1901, 1931 and 1941 include those of Seraikela and Kharsawan, but exclude those of the areas added to the district after 1941.
4. Figures given for 1961 and 1971 cover the whole district as it is at present.
5. N.A. = Not available.

APPENDIX III

Salient features of dams under Subarnarekha Multipurpose Project

1. Location	Subarnarekha Dam at Chandil near Jamshedpur	Kharkai Dam at Icha near Chaibasa
2. Types	Earthen dam on left side with spillway in the river	Spillway in the river portion with three dykes on the right side and two on the left
3. Catchment area	5,646 sq. kms	2,849 sq. kms
4. Maximum height	56.50m	38.40m
5. Total length	720.10m	1215.90m
6. Length of Spillway	228m	301.20m
7. Top width	8.75m	8.75m
8. Level of top of dam	196.00m	229.0m
9. Dead storage level	169.16m	205.5m
10. Dead storage capacity	35,157 ha m	20,354 ha m
11. Full reservoir level	192.00m	225.0m
12. Conservation level	189.00m.	225.0m
13. Conservation storage	1,14,725 ha m	83,885 ha m
14. Flood reserve	46,260 ha m	Nil
15. Water spread area at FRL	17,409 ha	12,748 ha
16. Cost	Rs 11,587.90 lakh	Rs 7,269.23 lakh
17. Target for completion	1988-89	1991-92

APPENDIX IV

Salient features of barrages under Subarnarekha Multipurpose Project

1. Location	Kharkai Barrage at Ganjia near Adityapur	Subarnarekha Barrage at Galudih near Ghatshila
2. Type	Gravity section on rock foundation with gates	Gravity section on rock foundation with gates
3. Catchment area	5,815 sq kms	13,629 sq kms
4. Total length	258.00m	82.90m
5. Deepest bed level	129.88m	82.90m
6. Crest level	133.00m	86.87m
7. Pond level	145.00m	94.00m
8. Gates	13 nos of 18×12m	25 nos of 15.24×7.62m
9. Top of hoist bridge	153.92m	105.77m
10. Cost	Rs 2,150.93 lakh	Rs 1,875.70 lakh
11. Target for completion	1989-90	1989-90

APPENDIX V

Salient features of canal systems of Subarnarekha Multipurpose Project

	Subarnarekha Dam	Kharkai Dam		Kharkai Barrage		Subarnarekha Barrage		Remarks
	Left Canal	Left Canal	Right Canal	Left Canal	Right Canal	Left Canal	Right Canal	
	1	2	3	4	5	6	7	8
Length (km)	134.4	19.2	32	14.4	17.6	60.8	64	Total 342 km
Discharge (cusec)	84.11	21.20	49.70	3.17	11.33	9.95	113.28	
GCA (ha)	1,15,264	21,447	61,580	1,320	24,680	10,927	5,074	Total 2,40,292
CCA (ha)	70,311	17,158	49,264	924	17,276	6,678	3,095	Total 1,64,706
Target for completion	1993-94	1991-92	1991-92	1993-94	1993-94	1993-94	1993-94	
Cost in lakhs	12,940.83	5,821.26		1,311.13		1,616.44	3,516.57	

One More Peril— A Report on Polavaram Project

DR P VENKAT RAO AND A TEAM OF SENSITIVE INVESTIGATORS

Governments, state and central, whether of the Congress, Janata or of regional parties in states, have been envisaging the construction of more and more large dams purely due to political reasons. It is sheer providence that some of these proposals await clearance on account of insufficient data available on environmental impact of these dams.

A dam project across the river Godavari at Polavaram, West Godavari District of Andhra Pradesh is proposed to be built. The Environment Appraisal Report states that it is mainly a diversion project of the river. With a length of 1,600 metres and a height of 50 metres in the deep course and 38 metres on the riverbed and submerging an area of about 638 sq kms (213 sq miles), this is likely to be one of the largest dams.

The State Government has bade several requests to the Central Water Commission to clear the Project, and also approaced the World Bank for aid. The project, when conceived, was to cost Rs 700 crores in 1971 but today its cost has risen to over Rs 2000 crores.

How the idea emerged?

It was at one of the regional workshops conducted by the Centre for Environment Concerns (CEC) at Vijayawada for the action groups involved in rural development, that the participant organizations took up the issue of the Polavaram Dam Project. They requested CEC to undertake a socio-economic and cultural study of the would-be displaced persons and of the ecological impact of the dam on tribals and forests.

After a number of visits of the Polavaram area, CEC undertook a socio-economic and cultural, sample-based study. Out of 250 villages, 29 facing submergence were selected, with a view that a minimum of 10 per cent villages would be covered from every taluk. Again, from each village, 15 per cent of the households of scheduled tribes, scheduled castes, backward classes and other castes categories were interviewed. The questionnaire covered their occupational pattern, income-expenditure indebtedness or savings pattern, their dependency on forests, land and river, intra-category and inter-category relationships, their opinion on dam construction and rehabilitation, etc.

Some of the main purposes of the Polavaram Dam are to supply water to the multi-crore Visakhapatnam Steel Plant Project and to generate electricity, which will not in

the least benefit the displaced persons or the rural poor. Electricity generated will be lifted through 400 kv lines to the industries. Though irrigation is also one of the main purposes of the dam, the benefits of this, as usual, will go to a few rich, who purchase lands belonging to the poor and reduce them to a position of landless agricultural labourers. This is evident from the responses of all categories of respondents when they were questioned on dam construction and rehabilitation.

The Polavaram Dam displaces about two lakh people (1.5 lakh according to 1971 census) from three states—Andhra Pradesh, Madhya Pradesh and Orissa: 223 villages from Andhra Pradesh; 10 from Madhya Pradesh and seven villages from Orissa are facing submergence. Altogether 44,513 hectares of land will be submerged, out of which 3,860 ha is covered by forests.

However, small dams, while helping the local populations, do not pose any serious environmental threats. Small check-dams can transform the economy of a couple of villages too. The traditional tank irrigation system has proved successful and has been helpful to poor farmers who use the silt from the dried tanks to make their land fertile. They take it as an off-season work. This silt reduces the zinc and manganese deficiency from the field which is very difficult to maintain artificially. Through small dams, there is no problem of alkalinity of soil as there will be no water-logging problems.

Water management is essential, but large dams are not always the right answer. Small dams, check-dams and tanks at various places will help the local people and reduce the costs on big canals, construction material, etc. Moreover, other natural resources are also not threatened.

Benefits

The benefits envisaged by the government through Polavaram Dam Project across the river Godavari, at Polavaram in West Godavari District, Andhra Pradesh include:

1. Irrigation of 2.83 ha in upland areas.
2. Stabilization of existing ayacut in Godavari delta.
3. Water supply to industries and Visakhapatnam city and en route villages and towns for drinking water.
4. Additional water supply for the steel plant at Visakhapatnam.
5. Diversion of 80 TMC of water to Krishna river basin.
6. Generation of 720 MW hydel power.
7. Navigation facilities from Polavaram to Visakhapatnam.
8. Integrated eco-development of the region.

(Taken as it is from government report).

But the ecological loss and cultural ethnocide and its interest in preserving the natural environment have inspired CEC to be involved in the study along with the local action groups.

The ecological loss

The big dams, howsoever economically beneficial they may be, cause serious ecological destructions. They change the quality of land, causing large scale deforestation, disturbing

wild life, causing health hazards, etc. The following is the ecological impact of Polavaram Dam.

Land

The dam causes submergence of land on a large scale. The reservoir submerges 4,413 ha of land.

Type of land	Area in ha	Percentage
Forest cover	3,540	7.95
Wet land	620	1.39
Dry land	27,500	61.78
Poramboku land	12,853	28.88
Total	44,513	100.00

The dam site is flat and entirely covered with alluvial soil, lateritic soil, clay and khandalite group of rocks. Soil structure in the submergence area shows that it is fertile, black soil which is ideal for cultivation of jowar, rice and pulses, and is used by the tribals for subsistence agriculture and by the richer sections for cultivation of commercial crops. Some area is also covered with Rajahmundary stones, crystalline and alluvium.

Secondly, in the absence of proper drainage facilities, the dam may cause large scale water-logging problem and increase in the ground water table may lead to easy water contamination.

Seismicity of the dam site is very important. Tremors have been registered at various dams and were believed to be due to settlement of reservoir basement consequent to impounding. Authorities say that Godavari Valley is one of the few places which shows little seismicity in an othewise seismic peninsular India.

The Godavari river flows along the faulted graben. The highest recorded earthquake in the region occurred in 1968 near Bhadrachalam. However, the seismic impact may be negligible, according to the concerned authorities, as the depth of the impoundment in the reservoir is less than five metres. Another governmental opinion is that since the height of the dam is less than 100 metres, seismological observations are not necessary.

Forest cover

The dam submerges 3,540 ha of forest cover. This does not include the forest to be submerged or deforestation caused by approach roads, appurtenant works, off-taking arrangements for main canals, electricity generation and transfer of electricity to distant places. Proper forest survey has not yet been done. It is estimated that more than 180 ha of forest cover will be disturbed for the above purposes.

The government claims that the forest cover to be submered is dry deciduous forest, mainly comprising of rough jungles and sparse woody forests. Compensatory afforestation is supposed to be taken on foreshore areas, and on the two sides of the main canals. Thus, the government says, the project has a beneficial impact on this area as it would enhance the

soil-water-plant relationship. Apparently fast growing tree varieties like eucalyputs will be planted. As many as 59 tree species are recorded in the submerged area and among them the endangered species are rare plants such as Lalbergia peniculate, Oogenic eojeinensis, Xylia xylocarpa, Cochlospermum religiosum, Swietnoides, Bridelia hamittoniana wall, Gardenia resimifera and Alangium salvigolium.

Wild life

Disturbance in forest cover directly causes the extinction of wild life. There is a wild life sanctuary, part of which would be affected by submergence due to the reservoir. This will also affect varied aquatic as well as terrestrial biomas.

Aquatic species

The prominent aquatic life that would be affected are Hydrilla plamogeton, along with important fish like Labco, Cirrhina, Anguila bangallensis, Hilas ilisha, Puntius microbrachium and Macolsmonii (prawns).

Terrestrial fauna

Terrestrial fauna affected include mammals, birds and reptiles.

1. **Mammals**
   According to the census conducted during 1979, there were four tigers and the number must have increased due to intensive production. Apart from tiger (Felis tigris), other mammals endangered include the leopard, sambhar (Cerves unicolour), gaur (Bos gaures), spotted deer (Axis axis), wild dog (Cuon olpinus), hyena (Hyena hyena).

2. **Birds**
   Peafowl, jungle fowl, partridges and quail seen in the submersible areas besides the common birds found in the dry forest areas would be disturbed. Migratory birds will also be disturbed. To provide nests to the migratory birds, the government plans to grow fast growing plants like eucalyptus.

3. **Reptiles**
   Reptiles endangered are Indian python (Python molurus), krait (Bungarus coeruleus), king cobra (Naja naja) and green tree snake (Dryophis species).

The main endangered fauna include tiger, panther, Indian bison, blackbuck, chowsingha, crocodile, python and peafowl.

Public health

There is an overwhelming evidence from the past that large irrigation projects bring with them potential hazards in the form of outbreaks of communicable diseases. Increase in mosquito menace, increase in fluoride content in water and increase in snails bring health problems like filariasis and fluorisis. The water table rise may lead to water contamination leading to outbreaks of diarrhoeal diseases. Due to excessive use of fertilizers and pesticides, the underground water may also get poisoned.

To prevent such outbreaks of diseases, there should be proper drainage facilities in the fields. To prevent contamination of water by domestic pollutants, sanitation facilities have to

be provided to people in command areas. Spraying weedicides in the reservoir to contain undesirable weeds will affect aquatic as well as terrestrial life. The onset of a communicable disease may quickly turn into an epidemic.

Cattle health

There is danger to health of cattle mainly in the water-logged areas. Parasitic diseases like roundworms, liver fluke, amphistomiasis, narachistosomiasis may prevail among the cattle population. Proper veterinary health facilities have to be provided in the command areas. Cattle which usually suffer on account of lack of grazing lands will also suffer with water contamination.

The cultural ethnocide

The displacement

In total, 250 villages from three states, namely, Andhra Pradesh, Madhya Pradesh and Orissa, will be submerged due to the dam project. As many as 233 villages (15,325 families consisting of 1,50,697 persons) in Andhra Pradesh, 10 villages (680 families, 2,717 persons) in Madhya Pradesh and seven villages (292 families, 1,170 persons) in Orissa face submergence. Altogether 1,54,484 persons will be displaced due to this project.

The CEC has conducted a survey in 29 of the 250 submerging villages. The survey probed into the basic lifestyle of the displaced persons, most of whom are tribals. The survey centered around their socio-economic and cultural conditions so that a just rehabilitation programme could be proposed. In all, 663 heads of families were interviewed (52.9 per cent are tribals), over a time-span of three months by a team led and guided by social workers, agricultural economists and anthropologists.

The following table shows the number of respondents by caste covered by the survey:

Caste	No. of respondents	Percentage
Scheduled tribes	351	52.9
Scheduled castes	68	10.2
Backward classes	127	19.2
Other castes	117	17.7
Total	663	100.0

The above table reveals the domination of tribals among the displaced persons.

Tribals, as elsewhere, live an isolated life extensively dependent on forests. So deeply are their lives interwoven around forest produce that life without forests is unimaginable for them. They depend on forests extensively for fuel, timber, fodder, hunting, bamboo, woodlots, honey, broom sticks, tendu leaves, etc. Their house-walls are made of bamboo. They also make mats, baskets and containers among other things from bamboo. They depend on forests for firewood and sell minor forest produce to supplement their income.

Only a few of the tribals practise shifting cultivation which is becoming increasingly impossible as the tribals cannot cut the reserved forest. Tribals who own land have restricted themselves to permanent cultivation and others have been cultivating the same patch of forest land which was cleared by them earlier, for which they are not entitled to get any compensation. To supplement their income, some tribals are also engaged in fishing.

Among the 663 respondents interviewed, 428 (64.55 per cent) are agriculturists, 20 (3.02) are artisans, 157 (23.68) agricultural labourers, 24 (3.62) businessmen, 16 (2.41) are employed by landlords, and 18 (2.71) are involved in other occupations like selling forest products, water transport and fishing.

Eightyeight (25 per cent) tribals do not own land and 50 of them practise shifting cultivation. Their income largely depends on agriculture, cattle, trees and forests.

Palm trees are an inseparable part of the tribal lifestyle as they provide them with toddy and palm fruits which become their staple food almost all through the summer. They use palm leaves for roofing their houses, making ropes, and their trunks are used as pillars in house construction.

It is very difficult to quantify their gains from trees in general and palm trees in particular. What happens when they are displaced? Can they take those trees with them? There are tribals who own as many as 1000 palm trees. But few of them make money out of them. Selling for money has not yet entered into the culture of these tribals.

An environmental appraisal report prepared by the Government of Andhra Pradesh says, "The area under submergence coming under the 150 contour above msl is mostly a tribal area, inhabited by a large tribal population dominantly composed of Koyas. The vegetation cover is dry deciduous forest mainly comprising of rough jungles and sparse woody forests. The soils are lateritic in nature and the average rainfall is 1000 mm. The project has beneficial impact on this area as it would enhance the soil, water, plant relationship and help in creation of denser vegetative growth in the foreshore area. A certain amount of vertical movement of tribal population is visualized which will ultimately benefit the tribal population due to greater forest productivity than in the lower reaches."

Expenditure

Their expenditure mostly centre around basic needs—food, shelter and clothing. Most of the tribals are under-clad. Major expenditure on clothing is by female members of their families. Their annual expenditure on clothing ranges from Rs 200-1,000. (There are tribals living in townships too. Their expenditure is obviously higher than those living in interior habitats). Expenditure on housing too is not much as their houses have bamboo walls with or without mud coating and the roofs are thatched. These houses need very little maintenance. But as they live on the banks of the Godavari, in case of floods they have to reconstruct their houses either partially or completely. Tribals say that they have to reconstruct their houses once in every five years.

The fellow feeling and the spirit of cooperative living is predominant in the tribals' lifestyles. They help each other in the construction of their houses. The one who owns the house need not pay any wages, but provide a good meal, with toddy, fish meat, etc., which are already available or on which the person has to spend very little money. He helps others too in the same way when others are constructing or repairing their houses. For housing, the tribals get bamboo, woodlots, and thatch from forests. But this has been quantified as income and hence the expenditure. In their cooperative culture—both with fellow tribals and with nature itself—housing is an easy task for them. Most of the tribals live in two or three roomed houses.

The tribals' food includes cereals or pulses produced. Some of it is purchased too. They go to weekly markets to buy essential commodities, and pay either in cash or through barter. For roots and tubers, some of them depend on forests. Food takes away a major chunk of their income, Rs 2,350-9,400 a year.

Health facilities do not exist in these areas. Minor ailments are treated by faith-healers or by a private medical practitioner whenever he visits the village. Education for tribals is to

know how to climb a palm tree and how to use a bow and an arrow. More than 80 per cent of the tribals do not send their children to schools for formal education. Their major assets are land, water, forests, which cannot be provided "as they exist now" through rehabilitation.

Tribal culture

Tribal culture is most susceptible to exploitation. Bartering their produce for commodities they require, is the simplest way the non-tribals fool them at the weekly fair. What tribals give in exchange is far more expensive. Yet money has little value for them. Non-tribals are cashing on their ignorance and innocence. Most tribals are aware of this yet they accept it as a reality. During the course of data-collection, tribals were asked questions on their relation with non-tribals and its impact on their marriage system, kinship relations and festivals; political parties and changes in their village traditional leadership pattern, their views on political parties; present-day economic system to exploit tribals. At the end, their opinion on the dam construction and the rehabilitation process was also sought.

Their responses were vehement and varied. There are instances of non-tribal men marrying tribal women purely on selfish motives—to buy land in the tribal women's name. Most of the tribals strongly felt that the tribal women married to the non-tribal men were being treated as labourers without any wages. Moreover this disturbed their kinship relations.

Interaction with non-tribals is also affecting their customs and festivals. A change in their dressing pattern is clearly visible. This has resulted in their indebtedness as they have to spend more on clothing. They are slowly looking towards chemical pesticides and fertilizers for increased production as non-tribals do. But, because of lack of awareness on how to use them there is a possibility of suffering from health problems.

Tribals feel that their traditional village order is replaced by present-day political system in which political parties and the government give prime importance to non-tribal issues. They say "it is only during elections that we hear something, but nothing substantial has been done till now". Tribal culture has not changed much. Their music, song and dance are very much a part of their life system.

As has already been discussed, theirs is a cooperative culture. Their interaction is mostly restricted to fellow tribals. They collect forest produce only to satisfy their needs. Tribals cannot be blamed for the diminishing forest cover. It is forest officials, hand in glove with contractors, and the industrialists, who are responsible for thinning down the forest cover. The monetary system is slowly making inroads into the tribal culture and contractors are luring tribals with money. The tribal men and women cut forests for supplementary income only during summers and in times of crisis.

Though the tribals are least affected by industrialization and urbanization, yet the nuclear family system is predominant. The type of marriage they have and their marriage customs influence this kind of family system. The bridegroom with prior permission from the parents of the bride, takes her away to another village to reside. The parents of the bride come to the village searching for their daughter, bring them to the village and the traditional leaders ask the bridegroom to pay the penalty and live in a separate house. In rare cases does a married son lives with his parents along with the wife. This must be the reason for the predominance of nuclear families. Joint family system is present in rich families of other castes only.

Culturally important places

Many culturally important places that are highly revered by the local population are also being submerged. These include Ramakrishna Math at Parentapalli, and some temples having

Kakatiya features. These are located at Pudimetta (Gandi Pochamma), Kachuluru Devaragondi, Sivagiri (Shiva temples), Rama temple at Sriramgiri and Kundinya Murthi temple at Chiravalli. The government proposes to set up a museum at the dam for their storage and exhibition. While more than 1.5 lakh people are going to be displaced, the government wishes to make it a place of tourist attraction. It says, "The Polavaram Project area is one of the beautiful scenic spots highlighted by rich vegetation covering hills and gorges through which the Godavari flows into the plains. The area has rich cultural heritage and there are popular centres of pilgrimage and worship which are highly revered by the local tribal population. The formation of reservoir and associated infrastruture will change these centres of isolation into leading tourist spots."

Opinions on dam construction and rehabilitation

The Centre for Environment Concerns is opposed to the construction of massive dams resulting in environmental degradation. A large number of people, mostly tribals are being displaced, who depend significantly on land, forests and water; whose culture is cooperative but prone to exploitation. Land in the command area is likely to be subjected to water-logging leading to alkalinity and salinity of the land, increase in pest and bacterial population, increase in health hazards. These and other related issues are not considered in conceiving and implementing the project plans, and the Polavaram Project is no exception.

Rehabilitation is important once the dam is cleared by the Central Water Commission. Rehabilitation is needed not only for those displaced persons, but for those who would be affected by other problems like water-logging and health hazards in the command areas of the project.

Opinions of the displaced persons

It is essential that the fruit of any development project should first reach the victims of development. If dam construction is viewed as a development project, it is essential that its benefits must reach the displaced persons. That must be the prime aim of any rehabilitation process. But our past experiences have shown a dismal picture. The needs of displaced persons have never been considered in their right perspective. Usually, the concerned authorities wash their hands off by paying meagre compensation—subtracting their own share and middle men's share from it. Most of the tribals, being illiterate, know nothing about concerned legislation, and are prone to being exploited. The sentiments of the would-be displaced persons are the same as those who are already displaced in other similar projects. The tribals here want land in compensation for the land submerged rather than money. "What do we do with money"? We cannot buy a piece of land with this money nor can we save it. "Money will be easily spent quickly on food, festivals and clothes," laments a tribal man. Another young tribal says, "I may be feeling like a king on the day I receive money, but from the next day onwards I will be a beggar all through my life. Today my life here is satisfactory, but if the dam is built here and we all have to vacate our villages, clearly our lives are in danger." Some young tribals were angry with the idea of damming the river and some others felt helpless. "If government comes and asks us to vacate, we have to do it. How can we resist a government?" An angry tribal remarked, "Even if all people vacate, I am not going to vacate this village. Instead of dying some where else without food and shelter I would prefer to drown."

"We may have to beg for anything we want. It is not possible for us to leave this place". The non-tribals, particularly the rich, had their own reasons to resist the dam construction. They felt, "The tribals have very little or nothing at all. They have very little property. They are earning their livelihood as agricultural labourers. They can do the same elsewhere to earn their livelihood. If the dam comes up, we are the losers, we lose land, house and other

properties. Tribal women or poor women are accustomed to work on agricultural fields for wages, whereas, look at our women, they cannot go out of the house. We may have to face many more problems than those tribals or poor." Irrespective of rich or poor, all displaced people face problems. But the effect on the poor is multiplied as they cannot solve their own problems, In case of tribals, displacement turns into cultural ethnocide.

Tension, anxiety and fear was writ large on the faces of all those who are to be displaced. Today, developmental projects are neither objectively considered, nor do they have a proper rehabilitation policy. When a proper policy for the rehabilitation of the displaced 'human beings' does not exist, it is far-fetched to expect one for rehabilitating natural resources, improving and maintaining the quality of land, water, air, planting endangered tree species, compensatory afforestation, rehabilitation of wild life, etc.

Recommendations of the study

These include:

1. Nuclear family has to be taken as a unit for rehabilitation purposes.
2. The displaced have to be informed well in advance about their future place of abode.
3. Culturally important places have to be identified and arrangements have to be made for their resettlement.
4. The displaced have to be given a minimum of five acres of land in the command area of the project, irrespective of whether they lost land earlier or not.
5. Financial help has to be given for resettlement, immediate domestic needs, starting agricultural activity, etc. Help in kind is essential, e.g., seeds, agricultural instruments.
6. The displaced have to be educated about Land Acquisition and related Acts.
7. Their resettled places should also have vocational training centres, educational institutions, etc., so that their children become independent.
8. Grazing lands have to be provided.
9. While resettling, persons of one village have to be resettled at one place only.

Rehabilitation in command areas

1. The farmers, particularly the poor and the uneducated should be encouraged not to sell their lands.
2. The farmers should be educated on the problems of water-logging and related problems.
3. Proper health facilities have to be provided to prevent epidemics.
4. Proper sanitation facilities have to be provided in the villages in the command area, to prevent water contamination.
5. Cropping pattern has to be devised and popularized so that food and pulse crops are taken up in rotation, thus maintaining quality of the land.
6. The farmers have to be educated about the importance of organic manure so as to reduce the utilization of chemical fertilizers and pesticides.
7. Field channels and proper drainage facilities have to be provided.

However, the question remains: What will the future be for the resettlers and their future generation? When will the people start to take action? (No action or organizing of public opinion has been going on so far).

A holistic rehabilitation process may make the project prohibitively expensive. The displaced should not make any compromises regarding proper rehabilitation. A proper rehabilitation policy may force the state authorities to reconsider the project and make fresh and more objective cost-benefit analysis. Such an objective cost-benefit analysis would probably force the dropping of the project itself. But the State's Minister for Major and Medium Irrigation Projects comments thus on rehabilitation, "No state has ever provided land on land compensation to the evacuees. We too have never done it before, and are not going to consider any such ideas". This makes clear what will be the state of affairs of the displaced tomorrow. Then, should the project be constructed at all?

CASES FROM OTHER ASIAN COUNTRIES

Social Implications of Nam Choan Dam, Thailand

PHILIP HIRSCH

Background

The proposed Nam Choan Dam is part of the Upper Khwae Yai Project in Western Thailand.[1] The dam would be 187 metres high, 430 metres wide, and flood an area of 223 square kilometres. It would have a generating capacity of 580 megawatts. Surveying for the dam commenced in 1978, and in 1981 it was recommended by the Electricity Generating Authority of Thailand (EGAT) that the dam be constructed. The Japanese Overseas Economic Cooperation Fund (OECF) provided two thirds of the funding for a 120 million baht feasibility study. While the National Economic and Social Development Board (NESDB) and the prime minister's office were considering the case, environmental groups, farmers who had been adversely affected by the Srinakharin Dam, students, and others mounted a campaign against Nam Choan. For several months in 1982, the Nam Choan controversy was a major topic of public concern, to such an extent that a special cabinet meeting in October of that year recommended a shelving of the plans pending review by a special working group that was to report within 90 days. Little more was heard regarding the dam until March 1986, when a cabinet committee quietly passed a resolution calling for a new 143 million baht study. This move was taken as a sign of renewed commitment on the part of EGAT to get the project approved, and opponents were quick to move.

Opposition to the dam is on a number of counts. Primary are ecological considerations, since the area to be flooded lies almost entirely within the Thung Yai wild life reserve. Together with the adjacent Huay Kha Khaeng reserve, this is mainland Southeast Asia, covering nearly 5,000 square kilometres in the two parks alone and containing an enormous range of wild life, including a number of threatened species. While the reservoir would flood a relatively small proportion of Thung Yai (approximately 4 per cent), it would be deleterious to the flora and fauna in three important ways. It would bisect the area, blocking seasonal migration routes and reducing inter-breeding population sizes of some species to a dangerously low level; it would flood the rarest tropical forest environment remaining in Southeast Asia, namely the lowland riverine habitat; and it would make accessible large areas of the rest

[1] The Khwae River, also spelled Qua, is the River Kwai of film fame. The river branches upstream of Kanchanaburi, near the famous bridge, into the Khwae Yai (lit. "Big Khwae") and Khwae Noi (lit. "Little Khwae"). To date, two large dams have been built, one on each branch. The Srinakharin Dam on the Khwae Yai and the Khao Laem Dam on the Khwae Noi were completed in 1980 and 1984 respectively.

of the reserve which would be certain to fall prey to illegal loggers and lowland agriculturalists.

My main concern here is to outline the social impact of Nam Choan.[2] It is, of course, impossible to disentangle the social from the ecological effects of such a project, since our concern with ecology is as much to do with the impact on people as it is with the environment per se. It is also important that we stress the environmental damage threatened by the dam in order to secure maximum breadth of local and international involvement in a campaign to stop the dam's construction—cuddly animals often attract more concern than do voiceless rural populations. In the following paper, however, I will focus on issues of direct social concern in order to highlight those issues.

Claims of the dam proponents

It is worth noting from the start that many of the arguments put forward in favour of dam construction are phrased in terms of the social benefits said to accrue. The arguments are broadly as follows. EGAT is primarily concerned with electricity generation, so it is not surprising that the main emphasis is on the need for increased generating potential. "Development" of the country is dependent on such an increase, according to EGAT, due to needs of industry in urban areas and the rapid electrification programme in rural areas that is currently linking half a million new households per year to the national grid. It is claimed that new capacity is needed by the mid-1990s in order to avoid shortages.

Wary of giving too much emphasis to the hydro-electric importance of Nam Choan, EGAT is keen to stress the multipurpose nature of the dam. Since 70 per cent of the Thai population still depends on agriculture, much of which is rainfed and subject to drought, any project that promises increased irrigation potential has immediate social appeal. Nam Choan, it is claimed, will greatly increase the irrigability of the Lower Maeklong watershed area by increasing the storage capacity of the system. Other than agriculture, recreation is extolled as a money-spinner and therefore a source of employment for local people to be created by the dam. This is especially important in this Year of Tourism in Thailand, with tourism now Thailand's top foreign exchange earner.

In addition to its positive arguments for Nam Choan, EGAT has attempted to pre-empt opposition to the dam in a number of negative ways. Foremost is the claim that large areas of Thung Yai and surrounding areas have already been encroached upon and that it is only a matter of time before the area is illegally cleared anyway. Construction of roads and increased numbers of officials in the area, it is said, will help to control illegal activity, and at least the timber that is extracted in relation to dam construction will be cut legally and be liable to tax.

Social impact of Nam Choan Dam

It is important to set out the above arguments in order to understand the tactics of those who are bent on securing approval, so as to be better able to counter such claims as part of a campaign. My first focus in this paper will thus be on the social impact of Nam Choan as it relates to the claims of the proponents. Following this, I will examine the more immediate impact on local people.

To justify construction of Nam Choan Dam in terms of its contribution to Thailand's development via increased electricity demand begs a number of questions. The first is the fundamental question of whether high-energy industrialization and rapid rural electrification

[2] Please see the accompanying paper by Virawat Theeraprasat for a more detailed account of the ecological impact of the dam.

are in fact suitable priorities for development. Seventy per cent of the Thai population still depend on agriculture for a living, and electricity affects their lives mainly in increasing demand for unaffordable consumer goods. However, given that Thailand's current development path as set by national policy makers is firmly set on industrial expansion and rural electrification, increasing demand for electricity may be accepted as a reason given, for present purposes. The next question that this raises is the scale of increased demand. EGAT has revised forecasts downward since Nam Choan was first proposed, due to a number of changes including a slowdown in Thailand's economic growth rate after the end of the 1970s. Since Nam Choan would supply less than two per cent of total electricity generation capacity, small changes in demand forecasts can alter radically the "necessity" or otherwise of the project.

On the other hand, since the total contribution of Nam Choan to the national grid supply would be so small, it is easy for EGAT to argue that within a short space of time (six years in the case of Nam Choan), Thailand will be short of electric power if the dam is not built. Using such an argument, the smaller the project, the more urgent it can be made to appear! Of course the fallacy in such an argument is that it begs the question of alternative sources of supply. Even if Nam Choan were to be built, new generating potential would have to be found given EGAT's demand projections. In effect, therefore, the trade-off is not between sufficient electricity with Nam Choan and insufficient without, but rather between generating electricity with Nam Choan or in some other way. Once this is recognized, the "anti-development" label EGAT attaches to dam opponents wears thin.

The main alternative means of electricity generation in Thailand are lignite and oil or gas powered stations. EGAT has argued in favour of hydro-electricity by virtue of its apparently free resource, namely water, reducing the need for expensive fossil fuel imports. There are several holes in this argument. First, accounting must include interest repayments on foreign loans secured to construct the dam; in economic terms, these are just as much running costs and a drain on foreign exchange as are oil imports. Meanwhile, to see large dams as permanent sources of power is fallacious, since siltation limits their life, and all existing dams in Thailand have had their projected life reduced due to increases in siltation following upstream deforestation. Second, lignite deposits in Lampang and offshore oil and natural gas in the Gulf of Thailand will provide increasing supplies of these fuels without affecting the balance of trade. Third, recent falls in oil prices have dramatically altered the trade-off equation between hydro-power and other forms of generation in favour of the latter. Fourth, many of the costs of dam construction are not accounted for due to their status as public goods (e.g., forest reserve land) or difficulty in precise economic valuation (e.g., threatened species, many of which are still unknown but may have important economic benefits). This is not to mention the externalities of dam construction, which are dealt with below. In sum, once we recognize the trade-off between different forms of power generation, the issue becomes clear: expansion of hydro-electric power cannot go on indefinitely to cater for continuous growth in demand for electricity, since there is a physical limit to the number of appropriate sites, and the real costs of dams relative to other forms of generation increase with each successive move up fragile watersheds. The fact that Nam Choan would require extensive encroachment on the finest area of protected forest in the country suggests that the trade-off point has long been reached.

The multipurpose nature of Nam Choan is highly illusory. No new land will be brought under irrigation as a result of the dam, due to the fact that all water flowing past the dam will enter the Srinakharin Reservoir. The only potential irrigation advantage of Nam Choan would be to increase the storage capacity of the Upper Khwae system for use on existing irrigated areas in the Lower Maeklong watershed. Of the reservoir's capacity, one third is in dead storage, which means that it can never be used for irrigation. More significant is the fact that EGAT would be reluctant to release water down to the minimum level during the dry season, since it would take sixteen and a half months to refill the reservoir assuming no water at all

was released from the dam (annual mean inflow = 2975 x $10^6 m^2$; live storage = 4100 x 10^6 m^2)[3]. Previous experience has shown that the irrigation advantages of large dams in Thailand have been limited, due to the timing of water flow according to the needs of the EGAT, who control the dam, rather than the Royal Irrigation Department or farmers, who have no say over when water is released.

The other "multipurpose" aspect of the dam is supposed to be tourism. However, the limited recreational advantages of the reservoir are revealed by EGAT's own figures. Since the maximum normal water level would be at 370 metres above sea level and the minimum at 331 metres, the draw-down would be 39 metres. An annual vertical variation of this magnitude implies a zone often hundreds of metres across which is flooded annually and thus devoid of life. No permanent recreation facilities can be built at the edge of the reservoir, since this edge is constantly moving. The relatively high live storage element of the reservoir thus also serves to destroy the supposed recreation potential. This may be compared with the recreation value of the Thung Yai and Huay Kha Khaeng forests that would be destroyed as a result of dam construction. This recreation value is not limited to the substantial number of foreign tourists who would much rather visit a pristine wild life reserve than a dam site, but also includes urban Thais who are increasingly in need of open space and faced with ever declining areas of forest, and local people for whom access to the forest has long been part of a way of life but who are never taken into account since this form of recreation generates no obvious addition to the national coffers.[4]

The agrument that the area would be encroached on anyway and that accessibility increases the possibility of government control of such encroachment flies in the face of all experience. It is true that the area has started to be encroached upon by illegal loggers and farmers in search of land—primarily along the road that EGAT cut illegally to the dam site in 1981, to the chagrin of the Royal Forestry Department. In every case of road construction into a previously forested area, loggers and settlers have not been far behind, and officials have been either directly involved in illegal forest exploitation or ineffective in stopping it. I carried out 16 months' anthropological fieldwork among recent settlers in nearby Uthaithani province, and the key element in deforestation and settlement of that area was the counstruction of roads into the area, initially for logging concessionnaires. Encroachment certainly would have taken place even without these roads, but more slowly, in a more orderly and less violent manner, and with a far less rapid and destructive impact on the forest environment than was the case.

We have seen, then, that the social benefits claimed by EGAT for Nam Choan are less than might appear. In the remainder of the paper, I will summarize three additional sets of arguments against the dam on social grounds. These are the impact on local tribal peoples; externalities caused by construction; and the inadequate scope of public debate that has been allowed to take place.

Two tribal groups live within the boundaries of Thung Yai wild life reserve. They are the Hmong and the Karen, both relying on shifting cultivation for their livelihood. The Hmong would be less directly affected by the dam since they farm at higher altitudes and are semi-nomadic. The Karen, however, live in permanent villages at lower altitudes, several of which would be flooded by the dam's reservoir. Altogether, some 2,000 people would be displaced. EGAT has encompassed resettlement in its plans. However, resettlement schemes

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[3] This year (1987) reservoirs of many of the major dams in Thailand have reached critically low levels due to drought in the dam watersheds threatening to halt hydro-electric power generation.

[4] Another aspect of the forest to consider in Thailand is its role as a traditional source of spiritual renewal according to Buddhist belief and practice. This could also be seen as an important "recreational" function in its role as a non-western type of "relaxation".

in the past have often been disastrous failures, both for the people concerned and for the areas in which they are resettled. The Thai authorities do not recognize the right of tribal groups to carry on shifting cultivation, branding it as destructive of the forest and illegal, since no land rights are held by those concerned. As a result, resettlement is in permanent settlements, which traditional shifting cultivators soon abandon, often selling the land to lowland settlers and moving on to clear new areas. There is thus a triple forest loss associated with dam construction: the area flooded by the dam, the resettlement area designated by the authorities, and the new areas cleared by those who object to forced resettlement. Meanwhile, increased accessibility of the shifting cultivators' swidden lands can be expected to lead to violent conflict with the arrival of lowland permanent cultivators.

Apart from the direct impact on those upstream of the dam, construction of a dam the size of Nam Choan threatens to affect people beyond the area of the dam itself. These externalities can be gauged from the experience of the Srinakharin Dam. Due to problems of leakage, the reservoir took almost three years to fill before electricity could be produced and water released; Nam Choan would take exactly two years, assuming no river flow below the dam and no leakage. The effect of stopping the flow of the Khwae Yai is to allow intrusion of saline water at the estuary of the Maeklong River, which in 1981 caused an estimated 600 million baht of damage to coconut plantations in Samut Songkhram province. The farmers were not compensated, as EGAT denied responsibility and blamed drought for the damage.[5] Another downstream consequence of dams that is difficult to measure but threatens livelihoods is the loss of nutrients for shallow water fisheries. Construction of Nam Choan would further reduce the supply of such nutrients to the Gulf of Thailand, which is already severely depleted of fish. There is also a "downwind" externality in the loss of moisture from evapo-transpiration that results from loss of forest cover, and this in turn can exacerbate the drought suffered increasingly by farmers in rain shadow areas to the east of Nam Choan. This year (1987) Uthaithani farmers' upland crops have been ruined by severe drought, which is in part attributable to deforestation to the west.

In addition to the spatial externalities, there is also a temporal effect in the intergenerational losses resulting from present-day dam construction. Loss of species that are yet unknown, and short-term mining of forest and forested land for immediate profit, are not accounted for as long term costs against the immediate benefits derived from such exploitation of resources.

A final social aspect is the imbalance of information surrounding public debate on Nam Choan Dam. On the face of it, Thai society is relatively open, and the fact that the issue has achieved its present prominence in the press attests to this fact. Nevertheless, the debate is far from balanced, for a number of reasons. First is unequal access to information, with EGAT preferring to release information as late as possible in order to be able to present the dam as a fait accompli. In 1982, the prime minister's office issued a letter forbidding public servants, including academics, to speak out against the dam, while at the same time EGAT had access to public radio to release a constant stream of propaganda in favour of its construction. Many questions have been raised concerning EGAT's feasibility studies and Environmental Impact Assessment, yet resources are not made available for independent study of the dam's impact. Even more serious is the way in which EGAT tries to stifle public opposition by various techniques, some ridiculous, such as the statement in early 1987 by a senior official that opponents "should have their heads cut off", but some more serious such as securing a statement of support for the dam by the Army Commander-in-Chief, which has the effect of intimidating those who would contribute to the debate openly and objectively.

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[5] This is a particular bone of contention between EGAT and opponents of Nam Choan, since EGAT supported its assertions by using false rainfall statistics that were four times too low in order to make its case for drought as a cause of the damage.

Immediate prospects

There is every indication that EGAT is set on construction of Nam Choan Dam and is pressing for a definite cabinet decision by the end of 1987. Yet a number of uncertainties remain. One is the source of funding for the dam. EGAT states that funds are expected from IBRD and OECF; yet both these agencies deny having received a request for funding or committed funds. The more significant uncertainty arises due to the strength of feeling against construction of the dam that has built up in Thailand and abroad, as a result of the campaign against Nam Choan.

On the international front, Friends of the Earth (FoE), Asia-Pacific People's Environment Network (APPEN), and the International Dams Newsletter (IDN) have all taken up the Nam Choan issue. Inside Thailand, the Project for Ecological Recovery (PER), World Wildlife Fund (Thailand), student environmental clubs, and a local citizens' group in Kanchanburi Province have all taken up the issue. Of great significance is the public opposition to Nam Choan by the Royal Forestry Department, and in November 1986 this led to conflict between officials of this department and EGAT.

Organization of tribal groups threatened by Nam Choan would be much more difficult, and perhaps ill-advised unless carried out in a sensitive manner. The reason for this is that the area immediately threatened by Nam Choan's reservoir was until the early 1980s under the influence of the Communist Party of Thailand (CPT), and since the CPT's downfall the military and Border Patrol Police have established a strong presence in the area. As a result, the local people are under constant surveillance and suspicion by the authorities. Any external attempt at mobilization under present conditions, therefore, might place these people in an even more difficult situation than the one in which they now find themselves. Many Hmong have already been forcibly removed from the area (not in connection with the dam) for "security" reasons, and there is evidence that they face a difficult future following resettlement. Under current political circumstances in Thailand, it is also important that the environmentalist opposition to the dam does not get tarred with the "communist" brush.

What is important is to get as much information as possible concerning the dam and to be able to answer EGAT on its own terms. That requires an understanding of EGAT tactics, vested interests, and ways round them. Coordinated opposition to Nam Choan at various levels (local, national, international) and among different groups (farmers, academics, students, conscientious government officials) is a pre-requisite to the saving of the finest remaining area of tropical forest in mainland South-East Asia.

Nam Choan Dam: The agony of the land

VIRAWAT THEERAPRASAT

During the past 25 years, Thailand has greatly developed since the first National Economic and Social Development Plan (1961-1966) until the present Sixth Plan (1987-1991). During this period, Thailand has plunged more and more into the world's competitive market or capitalism. In its quest for modernization, the Thai subsistence-economy is changing into an industrialized one with emphasis on technological processes and mass-production. The Thai way of life, with its simplicity, harmony with nature and kindness, is being destroyed by the influence of advertisements for luxurious facilities. International industries are exploiting developing countries and forcing destruction of nature, causing several ecological imbalances.

Under the circumstances, electricity demand is increasing under each National Plan, to feed expanding industrialization and the growth of modern facilities. At the beginning of the Fifth Plan, more than 70 per cent of total electricity demand increased by 10.6 per cent per year. Thus, the plan to increase power supply was drawn in advance to meet projections of long-term increase in electricity demand.

The Upper Khwae Yai Project or Nam Choan Dam Project was secretely introduced in a session of parliament at the beginning of 1986. The name 'Nam Choan Dam' was avoided to prevent protests from environmentalists and people in Kanchanaburi, the province in which the dam site is situated. Good cooperation among Electricity Generating Authority of Thailand (EGAT), cabinet ministers and high-ranking officials from the National Economy and Social Development Board (NESDB) resulted in the approval of the project and EGAT got the green light to go ahead. This was the first success for the Nam Choan Dam's supporters after the project had been shelved for three years.

Since 1982, protests aginst Nam Choan Dam have occurred several times. The government appointed a committee to study the issue and take a decision. Many people concerned in the case were invited to express their opinions in the conferences. There were many studies and surveys but the final decision has yet to be taken.

Background

Since the demand for electricity was rapidly increasing and the import of fuel resulted in an unfavourable balance of trade, EGAT tried in every way to explore local energy resources, eventually locating a suitable dam site in the Upper Khwae Yai area.

In 1965, EGAT, in cooperation with the Japanese government, under the Colombo Plan, made a project study of the Khwae Yai River. The plan consisted of two phases: the first one was to implement the Srinakharin Dam Project and the Lower Khwae Yai Project (Ta Tung Na Dam); the second phase was the construction of the Upper Khwae Yai Project, 135 kms above Srinakharin Dam. This project consisted of Nam Choan as the main dam and Thi Kong Dam as the lower dam.

In 1972, EGAT began the construction of the Srinakharin Dam and the Lower Khwae Yai Project (Ta Tung Na Dam), at the same time, developing the Upper Khwae Yai Project with Japanese government collaboration. In 1978, a feasibility study of the Upper Khwae Yai Project in engineering and economic aspects was conducted. The study, in cooperation with Japan International Cooperation Agency (JICA), the representatives of the Japanese government, was finished in 1980. EGAT assigned the Team Consulting Engineers Co Ltd. to make an ecological and environmental survey which was conducted in 1979 and 1980.

The feasibility study of the Upper Khwae Yai Project in its engineering, economic and environmental aspects concluded that the project would yield good benefits. So the NESDB sent the proposal to parliament for approval.

The Upper Khwae Yai Project

The Upper Khwae Yai Project is a hydro-electric project, consisting of Nam Choan Dam, which is the main dam, situated to the south of Tung Yai Wildlife Sanctuary, and Thi Kong, the lower dam, which is eight kms below Nam Choan Dam in the area of Kao Nam Choan Conservation Park. The main purpose of this project is to install four generating units with a capacity of 195 megawatts/units each. The powerhouse will be able to supply a total capacity of 580 megawatts and will have an annual production capacity of 1,168.2 million KWh.

Description of Nam Choan Dam

It will be a rockfill dam with an impervious core which blocks the Khwae Yai River 135 kms above Srinakharin Dam. The dam will be 185 m high and the reservoir's normal high water level will be at El. 370 m. Its capacity will be 5,950 million m^3. The reservoir surface area will be 137 km^2 (EGAT's figure is less than the figure of National Forest Land Management Division by 38.61 per cent). Its effective storage capacity will be 4,908 km^2. Four generating units are to be installed with a capacity of 145 mw/unit. The total capacity will be 580 mw and the annual energy production 1,168.2 million KWh.

Construction schedule

The construction was to begin when the project was approved by the government:

1983—Construction and installation of hydro-electric generation
1985—Fill the storage
1986—Store water
1988—Finish the project

The total construction period is seven years.

Project's cost

The total cost is 12,591 million baht (the figure in 1981):

—Foreign currency 47.7845 per cent or 6,016.5 million baht
—Local funds 52.2155 per cent or 6,574.4 million baht.

The Overseas Economic Cooperation Fund (OECF) sent staff to make a detailed study on the dam construction and estimate the loan. OECF supported further study and offered to fund the project.

Geological description of Upper Khwae Yai

The ground consists of boulders, sand and accumulated sediment of the former riverbed. The composition is not very strong. The rocks are recent, approximately 62-65 years old. The east side of Srinakharin Reservoir is composed of gravel from volcanic ashes and limestone of the Silurian Age, approximately 410-440 million years old, pressed on argillaceous limestone of Ordorician Age, 460-500 million years. The bottom layer is hard sandstone and hard sub-soil of Cambrian Age, 520-570 million years. The arrangement of these three layers is normal and it has been found that 123-130 million years ago, there was a layer of granite thrusted upward among these layers in a north-south horizontal line. The western part of the area is made of limestone of Permian Age, approximately 265-280 million years, running along the periphery of Srinakharin Reservoir.

There is a severe fault zone in the Upper Khwae Yai area: the Three Pagodas Fault Zone situated in Sanklaburi and Sri Sawat districts. The fault zone is composed of several kinds of faults. Each fault has its own nature and movement in different periods and makes up a vast area of hundreds of kilometres ranging from the eastern upland in Burma to the Three Pagodas plain in Kanchanaburi province and probably reaches the upper part of the Gulf of Thailand.

It is reported that the earthquakes in April 1983 had its centre in Sri Sawat district which is one of the Three Pagodas Fault Zone. This incident showed that the fault is active and that earthquakes may be induced again by the high sub-surface pressure.

Protest movements against Nam Choan Dam Project

In 1978, after the construction of Srinakharin Dam, it became obvious that a dam was causing a lot of damage in many respects: environmental, social and economic. Forests were severely encroached upon. A vast fertile land of 160,000 acres lay useless under the reservoir. Thousands of acres of forest land were turned into the residential areas of EGAT's officials and people's houses. Wildlife habitat was destroyed. Wild animals struggled to escape the flood; many were shot dead. People who had utilized the land had to move and adjust themselves to a new way of life. Srinakharin Dam did inestimable damage to both the precious land and the people who once lived there.

One of the obvious pieces of damage happened in 1980 which is the very year that EGAT filled the Srinakharin Reservoir. The rainfall in that year was unfortunately low. The storage of water in Srinakharin Reservoir decreased the water volume in Maeklong River. It caused salinization at the estuary of the Maeklong River in Samut-Songkram province causing severe damage to the coconut plantations in Samut-Songkram. Because of the obvious damage, environmental organizations gathered and made a study on the impact of the dam. In the meantime, EGAT was making a study on the Upper Khwae Yai Project and planned to begin the project in 1983.

The obvious damages caused by Srinakharin Dam induced anxiety among the people. They feared that Nam Choan Dam would cause further damage and that a vast area of forest would be lost under water. The number of wild animals would decrease and Tung Yai Wildlife Sanctuary would lose its fame as one of the richest forest and wildlife resources of Southeast Asia. They did not want to sacrifice the rich forest land with its utility for a small percentage increase in electricity-supply.

On 30 March 1982, Mr Pairot Suwannakom, Director of Wildlife Department at that time, brought the project up for discussion at a conference of the Wildlife Conservation Committee. A resolution was passed against the Nam Choan Project and EGAT was sued for cutting an illegal road from Srinakharin Dam to the proposed dam site. Having been sued by Ban Pong Forest Region Office, EGAT stopped cutting the road and removed the equipment from the area.

In the middle of April 1982, a group of journalists made a trip to Tung Yai Sanctuary to collect information. Nam Choan Dam became a controversial issue. Among the confusing arguments, there appeared voices of protest. Many officials and academicians expressed their opposition in articles and interviews. Protest activities began to fuse into a movement and there was a coordination among conservationists' groups, academicians and the people in Kanchanaburi. The voice was louder and threatened the dam's supporters. On 15 June 1982, Mr Chuchart Pramoolphol, the Undersecretary of State for the Prime Minister's Office issued a letter to the Director-General of the Royal Forestry Department and the rector of Mahidol University. The letter stated that officials who expressed views against the dam caused misunderstandings and conveyed a negative image of poor coordination among governmental agencies. Officials were asked to refrain from giving their opinions to the mass media over the issue. Those who intended to give opinions had to express them through the Office of the National Economic and Social Development Board.

While the dam opposition was silenced by the official order, EGAT moved ahead unceasingly. Radio Thailand kept on broadcasting the benefits of the dam. There was no objectivity left; nor was there justice.

In September 1982, the Society for the Conservation of National Treasures and the Environment, submitted a letter to the prime minister opposing the sacrifice of Tung Yai Naresuan Wildlife Sanctuary for the relatively small benefit connected with the dam and suggesting alternative energy resource. On 4 October 1982 a specially-convened cabinet meeting was held at Government House to decide the Nam Choan questions. The prime minister presided at the meeting and EGAT represented the supporters of the project. Dr Nart Tuntawiroon and Dr Surapol Sudara were invited as representatives of the opponents' side. The demonstration outside the Government House indicated the uniting power of people. Hundreds of Kanchanaburi dwellers and conservationists crowded outside the Government House to give their full support to the opponents and to wait for the resolution of the cabinet. Placards and banners were raised with the heading "Stop Nam Choan Dam"

Dr Nart's arguments in the meeting destroyed EGAT's case. As a result, the cabinet, which had been in favour of the project, was then in a difficult position. The cabinet resolved to set up a six-men working committee chaired by the Finance Minister, Mr Sommai Hoontrakul. The committee was to conduct further studies of the project and make a report by 10 January 1983.

On 5 November 1982, Dr Boonsong Lekakul, Secretary-General of the Association of Wildlife Conservation submitted a letter to Mr Sommai to inform him about the impact of Nam Choan Dam on wildlife. The letter said that the dam would block animals' seasonal migration routes between Tung Yai and Huay Kakaeng Sanctuary. This, Dr Boonsong said, would result in a decrease of wild animals' reproduction. In the letter, Dr Boonsong affirmed that Nam Choan project should be cancelled, since the loss of natural resources would be really enormous.

In December 1982, a group of students and professors from the Faculty of Environment and Resource Studies, Mahidol University, made a field trip to the Mae Chan Valley, on the site of the Nam Choan Reservoir. The purpose of this trip was to provide more information about the area as no ground survey had been made during the preparation of the project or after. EGAT's survey was made from viewing the whole area by air because at that time, Mae

Chan Valley was a sensitive area under the control of communists. The survey made by EGAT was too rough and could not provide enough detail.

The result of this trip revealed many significant data. The number of people to be affected by the dam amounted to 40 families, according to EGAT's survey, but it was found that in fact 2,500-3,000 people were living in the area. EGAT's claims of deteriorating forest were proved to be false, since the ecological balance there was well preserved by Karen customs.

Moreover, the group found two parallel lines of lignite deposits, vast enough to be seen with one's bare eyes. Once the dam was built, the deposits would be flooded without its quantity being measured. The quantity of lignites might be greater than that at Mae Mo Mine, Lampang province. Satellite pictures also showed vast deposits of mineral resources.

Archaeological ruins were also discovered in the proposed site. Several stone axes believed to be used by men in the Stone Age were found in the area of Gong Sawo Cave, Ban Kremg Bor. The group also found historical ruins such as pagodas, stone pillars and other items left by armies during the reign of King Rama I. Some archaeological ruins and broken stone utensils found were estimated to be 11,000 years old. Such facts were not found anywhere in EGAT's report.

The discoveries of this trip were announced to journalists and resulted in the decision of the Nam Choan working committee being delayed although the previous day, Mr Sommai, the committee's chairman, had said that all information concerning the issue was already at hand.

However, the government's impending decision was merely an effort to compromise with the opponents rather than to listen to the facts with open minds.

From 15 to 22 April 1983, there was a series of tremors with their epicentre in the area of Srinakharin Reservoir, Kanchanaburi. The tremors frightened the people in Kanchanaburi for they feared that the Srinakharin Dam would collapse and people would drown. The loss of life and property would be enormous. It is obvious that the earthquakes had been mentioned in the conservationists' petition submitted to the government to reconsider the project. The tremors caused a stronger voice of protest from people in Kanchanaburi and the issue came to be more widely debated.

On 25 August 1983, the Society for the Conservation of National Treasures and the Environment, wrote a letter to the prime minister referring to 121 recent tremors in Kanchanaburi and the adjacent area. The letter indicated the urgency of immediately studying the geology of the area, to probe into the real cause of the tremors. As long as no studies had been done, the letter suggested, the project should be dropped.

In the beginning of 1986, the PM's Office Minister, Mr Suli Mahasandana, who was also the chairman of the Nam Choan working committee (rep. Mr Sommai Hoontrakul) revived the Upper Khwae Yai Project and submitted it to the cabinet for approval and further study. It was a revival of the issue after it had been shelved for three years.

On 10 August 1986, the Natural Resources Conservation Club of Kasetsart University held a seminar on "Nam Choan Dam : a vital controversy" on the 15th anniversary of the club.

In the middle of November 1986, the PM's Office Minister, Mr Suli, proclaimed to the cabinet that more than 200,000 acres of land in the proposed site was deteriorating forest. He intended to justify the building of a dam in the deteriorating forest.

On 20 November 1986, Mr Pairot Suwannakorn, the Deputy Director-General of the Royal Forestry Department led a group of journalists on an aerial inspection trip to the dam site. It was revealed that the 200,000 acres of deteriorating forest that Mr Suli had talked about, were not in the dam site area and in fact were the result of the filling of the Srinakharin

and Kao-Laem Reservoirs or of settlements of people who were dislocated from the Kao-Laem Dam. Most of the lands deforested by encroachment were in the plains and the areas along the streams in BoPloy, Sai Yok and Tong Papoom Districts, especially in the periphery of Kao-Laem Reservoir, where there are settlements of dislocated people. The forest of Tung Yai Naresuan Wildlife Sanctuary was still in good condition.

On 28-30 November 1986, the Association for the Environment for the Future of Kanchanaburi, in coordination with Wildlife Fund of Thailand and the Student Conservation Group of 15 Institutions, set up an exhibition about Tung Yai Naresuan Wildlife Sanctuary at the City Hall of Kanchanaburi. In the exhibition, there were information boards about Nam Choan Dam and the richness of Tung Yai Naresuan Wildlife Sanctuary and a discussion on "Nam Choan Dam and the significance of Tung Yai Naresuan".

In February 1987, the Student Conservation Group of 15 Institutions arranged a seminar on "Nam Choan Dam: The Agony of the Land" at Thammasart University.

In March 1987, the House Committee on Public Health and the Environment invited representatives from the Association for the Environment for the Future of Kanchanaburi to present their views on the impact of Nam Choan Dam and local people's feeling towards the proposed dam.

In April 1987, the Project for Ecological Recovery sent two representatives to attend a global conference on the environment and natural resources protection at Penang, Malaysia. The representatives discussed and exchanged opinions on the Nam Choan Dam with other participants. The issue received much attention and some participants signed a petition urging the prime minister to reconsider the project.

In May 1987, the army chief, General Chavalit Yongchaiyudh gave an interview during his visit to EGAT headquarters after hearing a brief on the problems and solutions of EGAT. General Chavalit said that in the next 6-7 years, Thailand will encounter an energy crisis and that a hydro-electric dam seemed to be a good solution. He stated that the army was willing to help in guarding Tung Yai Forest after the dam was built.

On the next day, General Chavalit's support of the dam was criticized by Dr Surapol, the chairman of the Siam Environment Club and Mr Pisit, Secretary General of Wildlife Fund of Thailand. It is possible that EGAT planned to use General Chavalit's influence to silence the protest of academicians, officials and environmentalists who were against the dam project.

Though General Chavalit's support was criticized by environmentalists, his opinion still had its influence. Several high-ranking officials tightly sewed up their mouths after the new release. Agriculture Minister Ham Leelanond even told journalists that if it was necessary, parts of Tung Yai Forests must be sacrificed for the construction of the Nam Choan Dam.

EGAT's reasons supporting the Upper Khwae Yai Project

In the survey and preparation period of the project, EGAT has clearly indicated that the purpose of the dam was merely to produce electricity of 1,168.2 million KWh to reduce the export oil bill. Having been argued against and opposed by conservationists, EGAT began to compile the aims and objectives of the dam. The purposes claimed by EGAT so far totalled nine aspects:

1. To produce electricity
2. To distribute water for irrigation
3. To be a tourist spot
4. To develop a fishery

5. To dilute saline water and waste
6. To prevent floods
7. To supply water for consumption
8. To provide employment
9. To facilitate communication

Arguments against Nam Choan Dam Project and its impact

I. Multipurpose Dam

EGAT claims that Nam Choan Dam and Reservoir will add to the water volume available to Wachiralongkorn Irrigation Dam downstream on Maeklong River. Thus, EGAT says, the water volume will be controlled and provided to farmers for irrigation in seven provinces: Kanchanaburi, Ratchburi, Samut-Songkram, Supanburi, Nakorn Patom, Samut-Sakorn and Petchburi. Farmers will be provided with water in the dry season, EGAT claims.

The plan is superficially convincing, but every dam built by EGAT is mainly to generate electricity. They are not multipurpose dams as always claimed, but monopurpose ones. The statement that Nam Choan Dam will help provide irrigation to farmers in seven provinces is merely a nice ingredient to decorate the project. The Nam Choan Dam will not be different from Srinakharin or Bhumipol or any other dam built by EGAT. They are not constructed for irrigation and people who live downstream of EGAT dams all over Thailand know this fact.

Two-thirds of the water in the reservoir of a hydro-electric dam is "dead storage" and cannot be of any use except as a base for the "live storage", the water which has reached a high enough level to go through the dam's turbines. Normally, it takes quite a long time before the water reaches above dead storage. In the case of Srinakharin Dam, it took three years, since there were droughts and leaks in the limestone surface.

When the accumulation of water is a difficult thing, it is quite certain that EGAT would not spill a drop of it, if it were not necessary. Since the dead storage has to be kept, the water used for irrigation must come from the live storage which is less than half of the reservoir. When the rainfall is abnormally high and the water volume is higher than the capacity of a reservoir, the surplus must be released. This results in a flood. In the dry season when farmers demand water, the reservoir may have little more than dead storage. The water cannot be released since it has to be kept to produce electricity for the peak load.

The claim by EGAT that Nam Choan Dam will help with irrigation in seven provinces is untrue. The severe drought which is threatening farmers in Kanchanaburi and Supanburi is good evidence here. Srinakharin and Kao-Laem Reservoirs can't solve this problem at all. If Nam Choan Dam is built, so much water in the Khwae Yai River will have to be kept to fill the reservoir that people will be deprived of water supply for irrigation.

II. Fishery

According to EGAT, the Nam Choan Reservoir will be used for fresh-water fishery. But the dam will decrease water-flow downstream. This will result in the disruption of fish reproduction since they lay eggs only in the overflow season.

The Nam Choan Dam will block the flow of Khwae Yai river. The high quantity of oxygen in the once flowing water will decrease when the reservoir water lies still. Many species of fish may become extinct due to the decrease in the quantity of oxygen. Fish in the Khwae Yai River live and lay eggs among the rocks and sand of the river's bottom. When the dam is constructed, the reservoir's bottom will be covered with silt. A certain quantity of oxygen will

be needed to decompose organic substances in the water. It is impossible that many species of fish in Khwae Yai will be able to adapt to the condition of the reservoir.

Khwae Yai River is a habitat for several kinds of fish such as greater river abramine, rosbor, luciosoma, barb, jullien's golden-price carp, giant carp, greater black shark, tinfoil barb, smith barb, soro brook carp, greater brook carp, loaches, silurid catfish, etc.

Several kinds of barbs must migrate upstream to lay eggs. The dam will block the route and may cause their extinction. At the same time, many kinds of fish such as glass catfish, striped tiger nandid, jullien's mud carp, barbs, etc. that can adapt themselves to the new habitats will greatly reproduce and disturb the ecological balance of the river.

After Srinakharin Dam is finished, several kinds of fish migrated upstream. If Nam Choan Dam is built, where can they migrate? Virtually no upstream areas will be left.The possibility of their extinction will be very high.

The Khwae Yai River is also a habitat of the Kanburi giant softshell which is the largest softshelled turtle and found only in this river. This kind of turtle spends its life in the river. Only when it lays eggs does it creep up on the river bank. Unfortunately, the only remaining river bank is in Tung Yai Sanctuary. The dam will destroy its only habitat and may cause the rare creature's extinction.

According to EGAT's preliminary study, Nam Choan Dam will produce siltation at the bottom of the reservoir of 75,000 m^3 annually. This will reduce nutrient available in the water downstream of the dam and in Srinakharin Reservoir. It is estimated that the decrease in nutrient will result in a drop of productivity from 1,200 to 1,000 tons per year or lower. This loss will cost approximately 2,000,000 bahts per year.

In the past, the Gulf of Thailand was one of the world's richest fish habitats. After many important rivers were blocked by dams, the richness of the Gulf diminished. The loss is really enormous. The same situation happened with Egypt's Aswan Dam.The dam resulted in the rapid decrease in sardines in the Nile.

III. Flood prevention

As it is obvious that EGAT's dams are monopurpose and not multipurpose as claimed, the notion that hydro-electric dams can prevent floods is a pure myth.

In 1978, Khon Kaen province was flooded, despite the existence of Ubonrat Dam. When the water level is abnormally high because of heavy rainfall and it spills over a reservoir, the water must be released immediately since the strength of the dam to retain it is limited. Thus, the downstream area becomes flooded because of the release.

The recent problem of Thailand is not flood but drought. To build a bydro-electric dam cannot solve the problem of either flood or drought at all.

IV. Decrease in the quality of people's lives

The real beneficiaries of hydro-electric dams are owners of factories and city dwellers. People who live downstream of dams and other villagers suffer from the losses and impact.

The belief that a developed country must be an industrialized country which consumes a lot of energy and have every kind of modern facility, is too facile a conclusion. Real development must be concerned with people's quality of living and mentality. Have dams ever improved people's lives? Let's take a look at a few cases in history.

— In 1982, people in Samut-Songkram suffered from salinization of the sea water. Srinakharin Dam was responsible for this tragedy, which resulted in great damage to people's plantations. Many emigrated to find employment elsewhere.

— People in Sri Sawat and Sanklaburi who once lived happy lives on their ancestral lands have been dislocated to new settlements where the land is poor and not suitable for agriculture. The crop yield has fallen critically. Their new way of life with electricity has been influenced by TV commercials and modern luxurious facilities which they can't afford to pay for in cash. They have become indebted to businessmen. The younger generation heads for employment in Bangkok as they are left with no choice. These are the by-products of hydro-electric dams.

V. Impact on wildlife

Tung Yai Naresuan Wildlife Sanctuary covers 3,200 sq kms in the upstream of Khwae Noi and Khwae Yai Rivers. It is situated in the area adjoining Kanchanaburi and Tak provinces. The forests are among the richest in Thailand and are a mixture of six different kinds, namely mixed deciduous forests, moist evergreen forests, dry evergreen forests, dry dipterocarp forests, secondary growth forests and grasslands. The mixture of different forests benefits a variety of wildlife, both rare and common. The sanctuary has been declared the largest and richest wildlife habitat in Southeast Asia. The uniqueness of Tung Yai forests lies in the existence of Savanna, a vast grassland alternating with deciduous forests. The sanctuary is a habitat for many mammals such as gaur, barking deer, wild elephants, tigers, leopards, wild boars, etc.

Nam Choan Dam will take at least three years to finish. During the construction period, heavy equipment and explosives will trouble wild animals with their noise and may result in a great migration of wildlife. A large number of animals are sure to be shot for food and a vast area of wildlife habitat will be flooded.

Moreover, the reservoir will bisect the sanctuary and block the seasonal migration route of mammals. It will result in inbreeding among wildlife populations and the possibility of extinction will be very high.

A large number of creatures will be flooded out by the dam, especially amphibians, insects and those which live on the soil surface. Wild animals will be trapped on the land above the reservoir and may have to be shot, as in the case of Srinakharin and Chiew Lam dams.

VI. Destruction of archaeological sites

An archaeological survey done by the Team Consulting Engineers Co Ltd, in 1979 covered only the area 10 kms upstream from the headwork of the dam. However, even in that small area, two caves with prehistoric tools were found, namely Stit and Suwat caves. Surveyors found several stone tools aged 4,000-7,000 years old and a round ear-ring which is the largest bone ear-ring ever found. They belong to the Mesolithic and Neolithic period. A number of pieces of pottery of the Neolithic period were also found.

Anthropological evidence found near the dam site indicates that the area was occupied from the middle of the late Stone Age. If a real archaeological dig was done, the materials unearthed could conceivably stun the world, as happened with the Ban Chiang discovery in Northeast Thailand.

Even though EGAT made archaeological surveys, they have not been strictly done. Almost every time, they were merely surveys, not excavations. Much archaeological and anthropological evidence has also unfortunately been lost irreparably under the Srinakharin and Kao-Laem Dam.

Though Stit and Suwat caves will be above the reservoir's surface, they are near the dam's headwork and might be destroyed when the land is cleared. Mae Chan Valley, where the stone axes were found, is sure to be inundated. Nam Choan Dam will inevitably bury historical assets of incalculable value.

VII. Loss of mineral resources

In December 1982, a group of students and professors from Mahidol University made a survey near the dam site and found two vast lignite deposits. That was the first geological survey, as in the past the area had been inaccessible.

The dam site is a rich mineral resource. If adequate time and money were devoted to conduct an extensive survey, more energy and mineral resources such as lead, tin, lignite, wolfram might be found in quantities whose value far exceeds the savings to be made from the dam.

VIII. Impact on community health

There have been few studies in this field so far. However, the impact of existing dams in this respect can be studied. EGAT has set aside a small budget of about $ 34,000 for the study of disease-prevention but the study has not provided enough information.

Building a dam is a shock to ecological balance. The flowing water system becomes still and results in low oxygen and low quantity of other substances. Still water is a suitable habitat for snails which are hosts of parasitic worms such as hookworms and liver fluke, which are found among 90 per cent of people who live near Ubonrat Dam, Khon Kaen province. The reservoir can also be a breeding source for malaria mosquitoes as in the area of Srinakharin and Kao-Laem Dam.

In the case of the Volta Dam in Ghana, which has similar climate to Thailand, the number of schistosomiasis patients increased from five to 80 per cent within six years (1962-1968). Seventy thousand people lost their eyesight from onchocera disease brought by a kind of fly. These are tragedies caused by the development aimed at short-term benefits.

The statistics of diseases caused at many dam sites suggest that more research should be done to prevent the danger. Damage to people's health costs money and is a threat to human lives.

IX. Political impact

EGAT once suggested that the dam project should be supported because it will help organize tribal groups into settlements. EGAT reasoned that dam construction would make it easy for the government to develop employment and proper political ideas among hill-tribes. Settlements, for example, would be able to organize self-defence to expel the influence of the Communist Party.

It has to be pointed out that Nam Choan Reservoir will mark the border of the First Army Region and parts of the Third Army Region in Umpang district, Tak province. This division, it has been said, will prevent the expansion of communist forces in the adjoining area between Tak and Kanchanaburi provinces. In other words, the claim is Nam Choan Dam will help keep national security at the western border.

National security and political policy are sensitive issues that need prudent decision. Communist forces are not the only problem. The Kanchanaburi border has been a significant strategic area since the Thai-Burmese battles in the Ayudhya period. During the Second World War, it was used again by Japanese troops. Even today, the battle between Burmese soldiers and Free Karen troops occasionally takes place in areas of Ta Song Yang, and Umpang in Tak and an area of Sanklaburi in Kanchanaburi.

Nam Choan Dam will be a large dam only 60 kms away from the border. It is supposed to be 370 m above sea level and north of Srinakharin Dam (at 180 m) and Ta Tung Na Dam (at 63 m). If the battle between Burmese soldiers and Karen troops extends beyond the border, long-range missiles could cause damage to the dam. A raid is also possible since it is only a short distance from the border.

If the dam collapsed, the enormous volume of water would cause the collapse of both Srinakharin and Ta Tung Na dams. The three dams would fall like dominoes and flood Kanchanaburi in a very short time. Such a risk is really unaffordable.

A similar event happened in the Second World War, when England destroyed several dams in Germany. The story was made into a film called, "The Dam Busters".

X. Impact on national economy

The Nam Choan Dam Project is expensive. It will cost at least 12,591 million baht (the price in 1981). Nearly half of that amount will be in the form of a loan from foreign agencies and thus a national debt which will be thrust on successive generations of Thai people.

Cost-benefit analysis may not have been fairly carried out by EGAT since some assets are unlikely to have been calculated, such as the opportunity-cost of vast forest areas, the price of land being turned into reservoir, the value of archaeological and anthropological assets, mineral resources, wildlife, and intangible costs such as wider environmental impact, broken communities and loss of cultures of ethnic groups. Such costs are not likely to be taken into account in the cost-benefit analysis since that would obviously result in the rejection of the whole project.

An increased national debt, by upsetting the trade balance, makes it easier for Thailand to fall under the economic domination of other countries. The total interest paid to the creditors will be several times higher than the capital of the project's loan.

Conclusion

The Nam Choan Dam will lead to a severe loss of environment and natural resources, namely rich forests, vast pieces of fertile land, and marvellous landscape which is a precious inheritance of Thailand. The dam will block nutrient flow and reduce the productivity of certain aquatic animals and plants.

People in several communities will have to be dispersed from their ancestral land to seek other employment and forced to adapt themselves to the modern way of life. Some will encroach on new forest lands and many will migrate to cities and suffer from a chain of problems.

The fact that Nam Choan Dam will be built on a fault zone frightens people in Kanchanaburi. They will live in fear, since the dam's collapse would mean sudden deaths and nobody can guarantee that it will not happen.

People in Kanchanaburi now suffer from a severe drought, despite the existence of several dams. This alone suggests that EGAT's dams are not meant for irrigation. People in Samut-Songkram have also suffered from salinization which destroyed vast areas under plantations.

The whole impact and losses are incomparably higher than the value of electricity generated from the dam. The Upper Khwae Yai or Nam Choan Dam Project is a large project which will have a severe impact on people both directly and indirectly. The development of one's nation should give priority to the well-being of people, not to modernization and electrification while people are in a hopeless position.

The existence of 18 hydro-electric dams indicates that we have already lost a large quantity of our natural resources. The simplicity of countrylife is going to be replaced by modern culture. People who used to be self-reliant are falling into debt through having to pay for electrical products on an instalment plan.These disadvantages, some positively harmful, are concealed under the heading of so-called "development" and are spreading like an epidemic.

The Pantabangan Experience

PROF. GRACE DE LA COSTA-YMZON

Introduction

Pantabangan is located in the province of Nueva Ecija, 176 kilometres north of Manila, the capital of the Philippines. In 1969, the government of the Philippines constructed a dam, which was believed to be the biggest in Asia, at that time, at a cost of 34 million dollars, a World Bank loan. The dam dislocated 2,600 families, and inundated 12 barrios and 8,000 hectares of rice lands. In addition, it deforested around 30,000 hectares of mountain lands and ranges, which became erosive, with zero tillage, at 18° slope.

Large dams: Problems and impact

Large dams are infrastructures, that are believed to be necessary tools for modernization and development. In the Philippines the five years' development plans of the government, have earmarked the construction of five large dams, one in the Visayas and four in Mindanao. The first of these, was the Pantabangan Dam, constructed in 1969-1973.

The second was in Magat, Isabela, constructed in 1975-1979. The Chico Dam was discontinued due to people's resistance. The two others, one in Ilocos Norte, and in Tanay, Rizal, have not yet been started. Tanay residents are resisting the construction and the one in Ilocos, is being moved to Tarlac in Luzon. Words have it, that the real reason for the non-implementation is finding. The Aquino government is still pursuing the Tarlac Dam project and negotiations are going on, for a World Bank loan of 35 million dollars.

Social scientists and ecologists are two of the leading groups in the country, most opposed to dam construction. The reason is obvious. It is claimed that infrastructure development is an indicator of modernization, but the question posed by these groups is, modernization and development for whom? And for what?

The experience from the Binga Dam, for example, which was supposed to provide electricity to the Christina hydro-electrical plant, is a dismal failure. It has relocated and dislocated hundreds of families, who are now slum dwellers, some in Metro Manila and others, in many parts of northern Luzon.

The ecological problems, caused by dam construction, are innumerable. Large dams require thousands of hectares, as in the case of Pantabangan, it was 8,000. This also meant levelling mountains,denuding forests, deepening rivers, widening them and flooding already established rice fields and other cash crops.

Denuded forests will easily cause floods in the lowlands, because trees serve as the best anchor to the soil, and also serve as storage for water in their roots. Another utility of trees is buffer against strong winds, usually reducing wind velocities during typhoons. The impact on human beings is devastating. Because of the above problems, farmers in particular, suffer greatly whenever there is drought or strong typhoons, dry season or rainy season.

Life before the dam construction

Before the dam construction in Pantabangan, life was serene and tranquil. People were lowland farmers and did not know upland farming. They saw the dawn of their birth among the lush vegetation of the Pantabangan mountains, when vultures had not yet known the death of greed and the foliage nursed a thousand and one winged creatures, birds and insects, beasts of every kind and species to the satisfaction of hunters; and where the waters abundantly danced around myriads of streams and creeks, finding its way to the mouth of the Pampanga River. Farmers owned thousands of hectares of rice lands, isolated but self-reliant; and moreover, they were able to supply the foodgrains to the affluent towns of Cabanatuan and San Jose, even in drought and wet seasons.

This is the testimony of the people, especially the elders, who sentimentally recall the past and which to us means resistance to change. The story of Pantabangan is to the majority of them a nightmare, a bad dream. In a bad dream, one is reconciled on waking, as one finds the dream unreal. In the case of the Pantabangan experience, the dream and the reality are one.

Villagers were relocated in the uplands where the soil is no longer fertile but erosive. They knew of no other skills than farming. A few among the professionals and those, who had mechanical skills, such as machine repairing, carpentry and electrical technicians, were employed by the National Irrigation Administration.

Economics was the most critical problem. The transition from lowland to upland was a crucial moment for the people and it was a matter of their survival. The slash and bum method, employed during the first years of resettlement, was forced on them as a last resort. So bad was the situation that towards the end of 1977 people were visiting their neighbour's kitchens and running away with a pot of rice or whatever was found brewing over the fire.

Forces affecting displaced population .

Lack of planning for the displaced people is the most critical variable that was responsible for the social and economic dislocation. It was a skirmish between the people and the institutions, one blaming the other for the lack of employment and bad planning for the development of the people. On the other hand, people were blamed for lack of foresight and cooperation. The cash paid to them for their lands and properties should have been invested, the government agencies felt.

Local politicians were a disruptive force, as they saw in it the opportunity of lining their pockets. Kickbacks and overpricing of rice lands were awarded to politicians who were in collusion with the government officials. They were also a deterrent to the resistance of the people to the dam.

Even if the people were organizing themselves into groups that lobbied in Congress and in Malacanang Palace, to have the Bill repealed, their leaders would not join them. They were more interested in what they could get out of this project, such as employment for their political wards. Sessions in public information were organized and training for skill development was conducted by various government agencies to prepare people for a new life. On the

other hand, the youth were demonstrating and walking a mile-long procession, sometimes joining city demonstrations, to pitch in their voices of dissent. But, to no avail.

As the time for relocation was nearing, the rumblings became weaker. Reasons were many. The rationale behind the dam construction, to irrigate almost a million hectares of lowland rice lands and benefiting thousands of farmers, became acceptable to the people, even if it meant having to be sacrificed at the altar of development.

This sacrifice had some pragmatic considerations. Those, who owned lands were well compensated at a minimum of P 5,000 a hectare. Houses, animals, fruit trees, all and sundry had their cash values. On the other hand, there were also those, who claimed that some compensations were not yet completed and that, out of five mango trees, for example, only two were paid for.

In the words of many, cash flowed like the water of the dam spillway, but losing it out to merchants, who were peddling TV and radio sets, electric ranges and other modern devices, that spoke of instant modernization. The one biggest factor that caused the acceptance of relocation, was the declaration of Martial Law in 1972.

Though there were many factors considered, contributed to the final acceptance by the people, the fact remains that above the din of bureaucratic logic, the desire of the State is to call the shots, in every development effort. Max Guckman, in his works on substantive and functional rationality and elaborating Max Weber's theory, said:

> "The State will normally legitimatize the social order by controling class conflict within a stable framework of institutions and values, ostensibly standing above and outside them (the remote king as fountain of justice), and in doing so, perpetuate a society, which would otherwise be driven asunder by its internal tensions."

Mechanisms evolved to deal with them

Normally, organizing the people either to resist the construction, or if nothing could be done about it because a bigger force is far superior, organizing them to become powerful enough to participate in decisions that affect them.

In the Philippines, the decision to build dams rests in the national leadership, in collusion with the World Bank and IMF.

First, the Pantabangan project was different from Chico in many ways. The former was the right model for a debacle of the government project, while the Chico project could show, as proof, that the government had no concern for the welfare of the people.

Second, it showed that the loan package had no room for infrastructure, such as water, electricity, and roads, that were required for the benefit of the people. And third, the culture between the two, in that there are no ancestral lands in Pantabangan, which Chico has, was considered sacred.

Therefore, in Pantabangan, the mechanism, though one could look at it as passive acceptance, may not be completely so. There was resistance at the beginning, but in the end the people accepted the verdict. The mechanism evolved in dealing with the problem of dislocation was one where the people were taught how to organize themselves into community-based programmes or people's organizations.

From 1973 to 1977, Pantabangan was practically a ghost town. Worst, because within a span of four years, two typhoons visited the place, one in 1974 and another in 1976. The place, having been deforested had no trees to protect the environment from the fury of the winds. This was the situation when a group of young graduates from the University of the Philippines, with some faculty members, visited the place and saw for themselves that they had a challenge, to convert the theories learned in the classrooms into practice.

The concept of unplanned change was applied here. Unplanned change does not mean, having no plans, no structure, and no goals, no methodology and process. The term, unplanned, refers to a deliberate doing away with a "blue print", with the institution stating the objectives, goals, targets and indicators. Essentially, the concept is community-based, as opposed to institutional-based, community-oriented programme.

Systematizing experiences

The Action Research Group for Social Development Foundation, a private voluntary organization, is composed of a director, four members, two social workers, a doctor of medicine, and a business administration graduate. Later on, an agriculturist who is also an entimologist, also joined. We lived in the community for a year, during the preparatory phase and training.

This informal grouping, conducted a workshop among the different sectors in order to cull from them what they thought the problems and the needs of the people were, and what the solutions were. People perceived their problems as mostly economic, stemming from the fact that many of them being farmers and landowners, had lost their rice lands and livelihood to give way to a dam. Employment during the first four years of construction, 1969-1973, was obtained from the National Irrigation Administration, a government agency, which took charge of the construction.

It was on this framework, that we and the people conceptualized an approach to the social development problem in Pantabangan. It is a concept of social change, which begins with the person, then involves the family, the neighbour, the community and finally, the society.

From April 1978 to May 1979, it was a period of formal training in leadership and in community organization. The scheme was operationalized by sectors. The first group comprised the local government leaders, officers of government and non-government agencies. They were 22, who attended the five days' seminar.

There were groups consisting of workers, farmers, teachers, women, youths and fishermen. A total of 200 core group leaders, representing their sectors graduated from this training. After graduation, they organized their respective communities into interest groups. The farmers into Farmers' Association; the fishermen had their own. Their projects are production, by learning all the new techniques of their occupation and also marketing.

A membership of almost 1,000 farmers has spread in outlying barrios, numbering 12, in addition to the five existing ones, and have swelled the ranks of farmers. The fishermen now have 300 members, in contrast to 50 at the start in 1979. The teachers' group organized the literacy classes and is serving farmers and fishermen, especially in mathematics and fundamental English.

The women of Pantabangan, known for their timidity and domesticity, have liberated themselves through the leadership training, which according to them, has sharpened their reasoning and given them power of expression. They run the town's newsletter and the community-based health programme.

In the second year of the project, several interest groups were organized. The first to be organized was the farmers' group. Though the organizatiuon was already established, continuing education was held first on a quarterly basis. The different topics included ecology of upland cultivation, on soil, natural fertilizer, rainfall, perennial and annual crops. A discussion on community organization and an update on their knowledge and skills are a must. Conflict resolution is applied, when crises in leadership and relationship arise. Of interest to this paper is the case of the workers on the issue of labour exploitation by a State

agency, in fact, common to all government-run institutions. The other case is how the women organized the community-based health programme.

In January 1982, more than 1,000 workers in the government plantation areas made known their grievances to the government. It was at the height of Martial Law, when anyone who got agitated or incited others to agitate, had subversion charges levelled against him.

About 12 leaders attended a seminar to learn some techniques of organizing, in order to bring about some forms of justice to the toiling workers. They defined the issues, one of which was non-compliance with the agreement, and that all workers, as required by the government projects in Pantabangan would come from the area. Most employees at the National Irrigation Administration were political proteges.

The second issue, which was a more serious one, was the non-compliance of the hiring and compensation of workers. All of them were contractual, and were faced with the threat of lay-off after three months of working. Only a few were made temporary, and never made permanent, despite 10 years of their service. Still worse, their salaries were deducted for medical insurance and retirement benefits, when, as casuals and on temporary basis, they were not entitled to these benefits. In short, there was alleged graft and corruption, of padding pay-roll and alleged technical malversion.

After three months of organizing, which included letters to government officials, including copies furnished to the president of the Philippines, the Ministry of National Defence and other offices concerned, thousands agreed to join the protest rally, to be held at the NIA office in Manila. NIA promised to look into the matter and were sending their representatives on April 1982. The venue was changed, because people could not afford the transportation costs.

As 2,000 people amassed in front of the Municipal Hall, together with media men and some professional and religious groups, stood their ground, no official of the agency came to meet them. On the contrary, a truck-load of military men, fully armed, arrived. The people stood their ground, and argued that the assembly was legitimate and that they were waiting for the government representatives.

At 12 noon, the military dispersed the people and told them to go home. Media men were around to witness the event and a few of them where from radio stations in Manila. They went straight to the NIA office and reported the incident to the administrator, who apologized and was heard throughout the country.

After this incident, the workers persisted and after a month, succeeded in bringing the officials to Pantabangan for a confrontation, dialogue and negotiations. As a result, 2,000 workers, who were casuals, were given temporary appointments, and a roll back of their contributions to retirement and medical insurance, which they were not entitled to. A series of hearing was conducted to try the guilty parties.

It was a great victory for them and a lesson to many, particularly to those who would cow in fear of the iron hand of the military rule. They learned that freedom and liberation must be won by the people themselves and could not be given to them. One must fight for it and struggle to earn it.

The foregoing is a case of resolving conflicts through the process of social action and method in community organization.

The second case will demonstrate how the community was organized towards health reliance, using the strategy of community development.

At the end of 1981, three people's organizations, namely, (a) farmers, workers, fishermen's, teachers' and youth groups, (b) credit cooperative, and (c) community newsletter, were set up and the community-based health programme was organized.

The community-based health programme in the Philippines was pioneered by three rural missionaries, who conceptualized a health delivery system, where the community itself would take full responsibility for the health care and needs of its members. The responsibility of training them is with the team of medical doctors, community organization workers, and nurses. After three years of training the people, a mechanism will be drawn, wherein a linkage between the rural health unit and the CBHP is forged, wherein the latter provides the continuing supervision and some logistics, especially for vital medicines.

The ultimate objective is towards the institutionalization of new values in health such as those of preventive medicine, regular check-up, health education and early detection of disease.

In Pantabangan, 36 health workers were selected by the community, following their own criteria. Thirtythree of these were women. They went through a one-year training in health education.

From 1983 to the present, these health workers have staffed the five barangay health centres and are the frontline health personnel attending to the health needs of the people. Patients are first seen by them. Medical history is recorded including their initial impression. They take the blood pressure, temperature and vital signs. The midwives or the nurses supervise their work. Patients, with existing or pre-existing conditions are referred to the doctor. A system of home visit was also established. When a patient is bed-ridden, the health worker visits him, in order to monitor the changes in his condition.

Clinic hours are divided into (a) treatment and (b) preventive. Treatment days are held three times a week for the bigger barangays and twice a week for the smaller ones. Health education is conducted on days that are not treatment days. Again, it is the health staff with the community health workers, majority of them women, who are frontliners.

In January 1983, the five barangays put up their clinics, using the existing barangay halls. The health centre is managed by the community health workers. Patients are first seen by them.

From January 1983 to January 1987, much has been accomplished. In less than five years, 60 per cent of the total number of families (2,600) or 1,560, have been enrolled in the programme. This means, that the members have gone through a routine check-up, at least once a year and at most, every quarter. In all the barangays, 50 per cent reported the occurrence of illness at the early stage.

"Prevention is the best cure", has become the slogan for 90 per cent of the population. The indicator for this is the attendance at the health seminar meetings and the practice of visiting their health centres, not because they are sick, but because they want to make sure that they remain healthy.

In January 1988, the project launched an evaluation study of the programme, and an impact analysis of all the programmes. The community leaders and members of people's organizations will be the assistant researchers. They will undergo training in October.

Conclusion

In January 1988, the Action Research Group for Social Development Foundation will evaluate the organizing skills of farmers, fishermen, workers, teachers, youth and the women. At the moment, we see some signs of an increase in these skills, as culled from an increase in membership, the output in production of foodgrains by the farmers, not only in volume, but also in the variety of their crops. They have since gone into multiple-cropping.

There was also an improvement in soil formation. The farmers were able to avoid soil erosion through multiple cropping and avoiding the use of animals for land preparation.

The fishermen's groups are ready to market their fish in bigger quantity. They are planning to market their products, together with the farmers, first to neighbouring towns, which need food products badly.

In all of these groups, political action, especially in terms of raising issues with government institutions, as regards their rights as mandated by law and the new constitution, has been the basis of their confronting the State. For example, among the government workers, labour unions are being organized in accordance with the 1987 Constitution. They are being assisted by para-legal groups (senior students in law at the State University).

The farmers' groups, on the other hand, are studying all laws of the past regime that are found inimical to their rights to the lands they now occupy. They are now in the process of reviewing these laws, and will lobby in Congress for the repeal of all laws inimical to their rights and welfare. The women's group is strengthening the health programme and is also lobbying, together with the Alliance of Health Workers, a national cause-oriented association of all concerned health workers, throughout the country, for some budgetary assistance from the national government, to compensate community health workers.

All these groups are involved, as individuals, in the coming local elections, and are members of the new politics. In this scheduled local election, they have a candidate who will run and who espouses the programmes and projects that are people and community-based. The main problem, especially in the rural areas, is the militarization in the countryside. To the people, peace and order problems stem from the State. This seems to be an overlay of the past repression and it might take quite a while to shed the yoke of an oppressive system.

However, if people were able to mobilize, then with the democratic set up, there is plenty of hope.

Insights: a postscript

Academicians came to realize in this experimental laboratory, that classroom knowledge is only half of what we think, we know. If we have the theories, people have the facts. On the other hand, they too realized that they had half of the knowledge in the facts of everyday life. Both have come to realize that there is need for each other.

This awakening made us academicians seek community work, an essential part of the curriculum. This experience is now being replicated in an urban setting, somewhere in the heart of Manila, Philippines.

Batang Ai Dam: Socio-economic impact of resettlement

SOCIETY OF CHRISTIAN SERVICE, SIBU, SARAWAK

1. Introduction

The Batang Ai Dam was completed and became fully operational at the end of 1985. The construction work on the dam actually began in 1981.

It was as early as in 1962 that Batang Ai was identified as a potential site for developing hydro-electric power. But it was found uneconomic to embark on the project at that time. Subsequently, a pre-feasibility study carried out by Snowy Mountain Engineering Corporation (SMEC) of Australia further concluded that it was not economically justified to implement the project before 1990.

The world oil crisis in the mid-70s, resulting in a price hike, called for reassessment of the Batang Ai Hydro-electric Power (HEP) Project. The Study, financed by the Australian Development Assistance Bureau (ADAB) was undertaken in 1977-78. The results of the study indicated that the Project was technically and economically feasible.

In 1980, another grant was obtained from ADAB for detail site investigation and final design of the Batang Ai Dam.

1.1 Finance

The construction costs of Batang Ai Dam, which do not include interest on loan during the construction period, compensation and resettlement costs, were estimated to be M$368 million in 1982; the actual costs amounted to M$395 million. In addition, the compensation costs and the resettlement scheme approximated M$40 million.

The sources of finance for the project came from:

Asian Development Bank	M$ 90.1 milion
Overseas Economic Cooperation Fund of Japan	100 million
Federal Government of Malaysia	100 million
Malaysian Employee's Provident Fund	100 million

(US $1=M$2.50)

1.2 Location

The Batang Ai Dam is located at a rapid, Wong Irup, along the Batang Ai, a tributary of Batang Lupar. The site is 18 km upstream of the nearest township, Lubok Antu, which is 274 km by road from Kuching, the capital of Sarawak.

1.3 Dimension and capacity

The Batang Ai Dam consists of two dams, the Main Dam and Lima Saddle Dam. The Main Dam is a concrete-faced rock-filled dam with a height of 85 m above the foundation (116 km above sea level). It has a crest length of 675 m.

It created an artificial lake with a surface area of approximately 21,000 acres, submerging an area of 90 sq km of land surface underneath it. The reservoir, with a maximum storage capacity of 170,000 cu m is fed by a catchment area of 1,200 sq km.

The four generators at the Batang Ai power station are capable of producing 92 mw of electric power and generating an average energy output of 580 Gwh per annum.

The electric power from the Batang Ai is able to cater to a large portion of the electricity consumption in Sarawak, which was estimated as 100 mw in 1982.

2. Socio-economic impact

As many as 26 longhouses with a population of approximately 3000 Ibans (418 families) needed to be resettled as a result of the construction of the Batang Ai Dam. The people were living along the bank of the Batang Ai, upstream of the dam where their ancestors had settled in the area for 500-600 years.

However, five longhouses refused to move to the resettlement site as planned. Instead, they preferred to stay back within the vicinity of the reservoir by moving to higher grounds safe from inundation.

The rest of the people in 21 longhouses were shifted to the new resettlement site around the Nyemungan, Bui, Bintong and Sebangkie regions. The new site, which is not far downstream of the dam, covered an area of 7630 acres acquired by the government from the original settlers there.

2.1 Views of the affected people

An extensive survey was carried out by the Sarawak Museum in July 1979 to gather the views and attitudes of the affected people towards the Batang Ai HEP Project and the resettlement scheme. The results of the survey indicated that:

52.3% expressed unfavourably to resettlement;
32.3% agreed to abide by resettlement;
14.7% were uncertain; and
0.7% gave no response.

Among those who agreed to move,

12% were fatalistic (inevitable, following the wishes of the government);
15% agreed, abiding by the wishes of the majority of their leaders;
16% agreed conditionally, only if the terms were favourable to them.

Of those who expressed disapproval to shifting,

16.7% found shifting troublesome and expressed strong dislike;
14.5% did not want to leave behind their properties like land, crops and fruits trees;
2.4% felt no suitable alternative place would be found;
1.7% expressed difficulty in finding, food, e.g., fish and wild game.

Furthermore, the people envisaged the following problems to arise from inundation of their homeland:

* loss of their properties;
* loss of source of income from pepper and rubber;
* loss of traditional heirlooms and assets;
* starting a new way of life all over again;
* natural disaster as punishment by the gods for flooding sacred land;
* fear that the government would not meet their demands; and
* others, such as not enough areas to plant paddy

2.2 Resettlement promises

Despite the results of the survey on the opinion of the affected people, the government went ahead with the resettlement plan to ensure the successful implementation of the Batang Ai hydro-electric power project. A committee was formed to formulate the resettlement policy and consisted of:

Sarawak Electricity Supply Corporation, SESCO;
Land and Survey Department;
Sarawak Land Development Board, SLDB;
Sarawak Land Consolidation and Rehabilitation, SALCRA;
Public Administration Department;
Department of Agriculture;
Ethnological Department of Sarawak Museum;
Sri Aman Division Resident;
Pemanca/Penghulu of the affected area. (chiefs of the village headmen)

In addition to the compensation paid to each family according to the rates specified in the next section, the resettlers were given certain promises. An area of 11 acres of land around their new longhouses would be allocated to them for the following uses:

Rubber	5 ac.	Terraced rice	2 ac.
Cocoa	3 ac.	Garden	1 ac.

The resettlers were told that the crops would be ready for harvest when they shifted. Besides, the people were also assured of free housing, water supply and electricity.

2.3 Compensation rate

Initially, the affected people demanded compensation money of M$2,000,000 for every family, regardless of the amount and the worth of the properties they possessed. But this was not accepted by the government. In its place, the Compensation Steering Committee proposed an alternative compensation scheme.

First, the Land and Survey Department conducted ground surveys to measure land area and to obtain evidence of ownership. Attempts were made to quantify the properties of each family. Then, the valuation of the land and properties was assessed through negotiation with the individual family concerned.

The compensation rates for various items are listed below:

Cash crops	Rubber	M$ 18.00/unit
	Pepper	25.00/unit
Fruit trees	Durian	77.00/unit
	Langsat	50.00/unit
	Rambutan	40.00/unit
	Engkabang	80.00/unit
Family room (as deposit for down payment for new longhouse)		8,000.00/unit
Individual/Communal burial ground		M$ 500.00 each

2.4 What actually happened to the affected people

Housing

The people were forced to move out of the areas as the water built up behind the reservoir. This occurred at the beginning of 1982. On the other hand, as the new longhouses were not yet built in the resettlement area, the people had to put up simple and supposedly temporary huts. They were given M$ 1,000 per family for purchasing the building materials. But they lived in such conditions for almost a year until the proper longhouses were completed at the end of the year.

Instead of getting a free "apartment" in the new longhouses as promised, each family was asked to pay back the housing loan of M$ 27,000 at an interest rate of 8.5 per cent per annum over a period of 25 years. This worked out that each family was supposed to pay M$ 120 per month and this added up to the total amount of M$ 44,000. The first instalment was deducted from the compensation of the old longhouse at M$ 8,000 per family. People refused to pay the rest of the loan. Worse still, the longhouses were made from poor quality materials. After five years, some of the wood started to rot, the roof leaked, doors buckled and the foundation showed signs of weakness. Furthermore, the electricity and water supply were only available a year and a half later.

Land

So far, each family, in actual fact, had only received one acre of land for home gardening. Most families planted cash crops like pepper and cocoa with vegetable in between the rows. The two acres of land to be used for cultivating rice had not been given to the people.

The 5 ac. of land for rubber and 3 ac. for cocoa were still under the SALCRA land development scheme. They were not divided into plots and distributed to the people. Actually, the crops were not ready for harvest, as promised, when the people first moved to the area. Only then was cocoa planted, while cultivation of rubber began much later, in 1986.

The people did not know when they would finally own their promised land and how much they would have to pay in return. They were told that they had to pay all the loans which covered the seedlings, insecticides and fertilizers already applied.

Electricity and water supply

The people were not getting free electricity and water supply after all. They had to pay, on an average, M$ 10 per household per month in 1986 (at $47 per unit) but this increased to M$ 20-40 per household per month in 1981, for electricity. As for water supply, the figure shot up from M$ 3-5 per household per month in 1986 (at $25 per litre) to M$ 5-10 per household per month.

Income

The main source of the income came from working under the SALCRA scheme. At least one person from each family had to work on the farm. But a worker was only paid M$ 8 per day by working on a daily basis and received pay at the end of the month. Usually a worker could only work for 10-15 days per month as there was insufficient work on the farm.

Consequently, many people returned to shifting cultivation of hill rice to supplement the food supply. Some families were fortunate to rent land from their relatives while others planted on the fringes of the cocoa farm, road and riversides.

Though the people were allowed to catch fish from the reservoir where there was plenty, the fish caught was small and of poor quality.

Facilities

As the people were moving nearer to the townships they had better access to educational and medical sources. A new primary school was opened in early 1979. For medical treatment, peole could go to the nearby dispensary at Nanga Mepi and it was easier to reach the general hospital in Sri Aman. A regular bus service operates between the resettlement area and Lufok Antu. This resulted in more frequent trips to the town.

Compensation money

The majority of the people received between M$ 5,000-50,000 for each family as compensation, depending on the amount and value of land and other properties they possessed. Only very few families like the Penghulu (appointed head of the headmen) received the highest compensation of M$ 300,000.

The compensation money was paid to the "head of the household" who is normally the man. Old people and women did not get the money directly. Similarly, the land was registered under the name of the man.

Until today, there are some families in phase II who have not received the compensation money. They are waiting for the Land and Survey Department to finish the survey and valuation.

2.5 Impact on people

Apart from the problems and difficulties faced during and after the resettlement, there were serious implications of the short and long term impact of resettlement on the people. A recent survey, carried out in 1986, revealed shocking facts and figures on the condition of the people as compared to the past. Some of the results are summarized below:

	Present	Past
Employment	46.4% wage earners 34.9% farmers 11.9% unemployed	97.9% consider themselves farmers
Income	M$ 91 per household per month (M$ 40-100 per household per month—64.7%)	M$ 530 per household per month (M$ 350-800 per household per month—75%)
Expenditure	M$ 406 per household per month (M$ 200-550 per household per month—75%)	M$ 285 per household per month (M$ 160-500 per household per month—85.5%)
Land ownership	1 acre—59.8% 9 acre—28.5%	140.2 acre (51-200 ac.—7.5%)

Facilities satisfaction		
Electricity	67.2%	10.7%
Water supply	58.6%	16.5%
Medical	96.9%	66.0%

It can be deduced from the survey results that the affected people have changed from (self-employed) farmers to wage-earners (farm-workers). Their income had reduced drastically while expenditure increased and the most profound adverse impact of resettlement was the diminishing ownership of land.

3. Conclusion

3.1 Implication of economic impact

There was a drastic change from subsistence economy to cash economy. The people were no longer able to practise their traditional economic activities of shifting cultivation of hill rice. There was no forest in the vicinity of their new longhouse for them to collect wild vegetable, rattan, "engleafang" (Illipant) and other jungle produce. Fish and animals could not be easily caught to supplement the protein diet. With this change, the one-time simple producers were reduced to wage workers. In the past, the longhouse economy was an independent, self-sufficient and self-reliant economic unit. The ownership of land and the production system were in the control of the people. But the people have lost control of all these. Their arrival depends on the work available under the SALCRA scheme which is controlled by the management. It is questionable whether they will get back the allocated plot of rubber and cocoa which were promised to them.

All these changes were best summed up in the words of the people themselves: "Everything needs money now, and we don't have money because there is not enough work and not enough land"

Obviously, the affected people are not able to cope with this drastic change from subsistence economy to cash economy. It is true that most families have received a large sum of money from the compensation. But the amount of money did not last long. Without a sustainable economic production, the people would end up in desperate situation, after the compensation was used up. This is precisely where the people are now.

3.2 Social and cultural disaster

The drastic change from subsistence economy to cash economy will lead to the destruction of the culture of the affected people and their social organization. In particular, the practice of shifting cultivation is not merely an economic activity but intricately integrated with the life of the longhouse people. Hence with its passing, the people are losing their traditional practices, beliefs and custom and certain values associated with it. For example, people are working for wages, in places of the exchange labour commonly practise in shifting cultivation.

Consequently, losing control over their livelihood and inability to cope with all the drastic changes, has completely shattered their confidence in life. The condition is aggravated by low wages, irregularity and shortage of work under SALCRA scheme. This has created great uncertainty about the future, obviously.

However, the question remains: What will the future be for the resettlers and their future generation? When will the people start to take action? (No action or organizing of public opinion has been going on so far.)

Bakun Dam: Educational and organizing efforts

SOCIETY OF CHRISTIAN SERVICE, SIBU, SARAWAK

Bakun is an area of swift flowing rapids along the Balui River in the Upper Rajang Basin. The proposed dam site is 37 kms from Belaga town in the 7th Division of Sarawak.

Origin of project

Bakun was identified as one of the potential sites suitable for hydro-electric power (HEP) in Sarawak in a study by the Sarawak Electricity Supply Corporation or SESCO, in 1980-81. In mid-1982, the government announced plans to build the Bakun Dam.

The rockfill dam will be 204 m high and one km long. About 700 sq kms of forests and farmland will be flooded. It will create a reservoir with a surface area larger than Singapore Island and it will have a maximum capacity of 2,400 mw. The electricity will be transmitted to Sabah, West Malaysia, and neighbouring countries. The transmission to West Malaysia can only be done using an undersea cable, 650 kms long, which will be the longest of its kind in the world.

The Project will cost between $ 10-20 billion. Nine feasibility studies costing $ 37 million were conducted but not one has been made public. The government's assertions that the Bakun project is safe, technically and economically viable and beneficial to the nation, are based on these unreleased studies.

It is the government's energy policy to reduce dependence on petroleum and to develop HEP. It aims to supply abundant cheap energy necessary to implement the National Industrial Plan. The emphasis is on large-scale energy-intensive industries.

The Bakun Project is also supposed to benefit the local residents. The government claims that it is "the only answer" to the under-development problems of the area, and that the reservoir basin communities will benefit from the social, economic and political development by being resettled.

Although the information given by politicians and officials has been grossly lacking and sometimes contradictory, the people will probably be resettled into plantation schemes as in Batang Ai.

The people

Over 4,000 people will be affected. They come from the Kenyah, Kayan, Kajang, Ukit and Penan tribal communities. They live in 52 longhouses in 15 villages. These Orang Ulu or 'people of the interior' have lived for generations in the upper reaches of the rivers.

Traditionally, they live in longhouse communities practising shifting cultivation and they also gather and hunt. Their way of life, their culture and economic system are based on the land. The forests provide food and essential materials for housing, boats, articles for daily use and craftwork. Their main crop is hill paddy.

Traditionally, they do not use much cash but in recent years, modern urban values have become more prevalent through the presence of government servants, traders and the schooling system. The capitalist system has also intruded into their lives through the logging industry. More and more, the communal spirit of sharing is being overtaken by individualism as the cash economy becomes more dominant.

The construction of the Bakun Dam will mean the destruction of their culture, the heritage of their lands given by their ancestors, their homes, farms and sacred burial grounds. It would mean the dominant capitalist system wiping out the people's own tribal system.

Educational and organizing work in response to the threat

In the face of the potential tragedy, some native youth in Belaga formed an ad hoc committee in 1982 to discuss the problems affecting their people. The SCS (Society of Christian Service) made contact with this group and a gathering was held in Belaga town with church members to discuss the issue, and slides of the Chico Dam struggle were used. However, such gatherings could not be continued due to pressure from the authorities.

In 1983, the SCS then saw the need for a full-timer to visit the affected longhouses to provide information to the people and to find out the people's feelings and opinions on the issue. The government would not disclose information on the project; instead, politicians and officials issued promises of development and warnings of repercussions if the people did not support the project. They did not consult the people. Civic assemblies or public gatherings were more like government propaganda sessions. Community leaders were called for meetings with government officials to make sure they gave their support to the project.

In mid-1984, a native youth from Belaga decided to work full time on the longhouse campaign. He visited the affected longhouses to give complete information about the project, and its possible impact. Initially some people supported the project because the politicians told them their homes would not be flooded. They thought having a reservoir would make it easier for them to travel on the river as the dangerous rapids would be covered by water. But when they realized that all their homes and farmland would be flooded, they began to voice their opposition.

The affected people were also informed about HEP projects elsewhere. Ibans from Batang Ai who had been resettled were brought to Belaga to share their experiences. Later, some Belaga people were brought on an exposure programme to Batang Ai.

In 1985, another full-timer started work on the Bakun public education and campaign in the urban areas of Sarawak. A Bakun Dam Committee under the Environmental Protection Society of Malaysia was formed to gather and disseminate information to the public. Contacts with action groups were made to widen the campaign. News releases were made to demand for the release of the feasibility reports and the Environmental Impact Assessment Report. Letters were sent to Members of Parliament, demanding full public discussion of the project. International groups were contacted to pressurize World Bank, Asian Development Bank, consultancy firms and contract companies who were approached by the government.

In the same year, a group of headmen and youth were brought on a people-to-people tour to Uma Akeh in Baram where the people had organized themselves on logging and quarry issues. This was to enable them to learn from the Baram people's experience of organizing to defend their rights to their land.

In late 1985, a signature campaign was launched among the affected communities. By February 1986, 2,200 signatures had been collected and released at a press conference in Sibu, where longhouse leaders expressed their opposition to the project.

Forums were organized in urban centres in Sarawak and in Kuala Lumpur to discuss the various aspects of the project and the implications on the people and the country. These forums were well attended by the public. Unfortunately, government officials who had been invited, refused to participate.

Logging had also become a problem to many communities then. To raise their awareness of their rights especially with regards to land, a para-legal training workshop was held in late 1986. Participants comprised of community organizers and concerned natives. Organizing communities to defend their land was one important aspect.

In the same year, a postcard campaign was organized to garner support from the urban folk to pressurize the government to scrap the project. An information pamphlet was also distributed. Up to now, the postcards addressed to the Prime Minister of Malaysia are still coming in.

In 1986, the longhouse campaign continued in some isolated communities. But these were hampered by the difficult terrain and the nomadic way of life of the Punan.

In late 1986 and this year, the issue became quiet as the government was facing financial difficulties. We have heard that the West German government has decided not to give any support to the project for the next 10 years. The German Parliamentary Committee on Economic Cooperation has commissioned socio-economic and ecological studies and will publish the results. The World Bank has also indicated that they will not fund the project.

Recently, the Malaysian government announced that it was rethinking on HEP projects. However, the project is still not scrapped. SESCO commissioned agricultural and social surveys to be carried out by the Sarawak Museum and the Agricultural Department in the Bakun area. This is probably to prepare for the resettlement of the people. However, the people were not informed of the true purpose of the surveys and only one community was suspicious and refused to cooperate. Even in this community, most of the people gave in after persuasion.

In the meantime, a para-legal workshop was held in that community to discuss about land problems, especially in Bakun, and also to understand the root causes. A few concerned members were interested to take actions to defend their land from being destroyed. For a start, protest messages were painted on the rocks at the proposed site.

Many of the people now think that the Bakun Project has been scrapped because there is no activity at the SESCO station at the proposed site. But the government has brought a group of community leaders from the villages in Belaga to West Malaysia. They were given a tour of the government plantation schemes and a hydro dam. The present land development policy of the state government is large scale plantation schemes for resettling natives grouped together from different longhouses. It is probable that the government plans to resettle the Bakun people in such schemes.

Information on such existing schemes has been gathered and people-to-people tours between the Bakun people and the plantation workers will be organized in the near future. This will help the Bakun people to understand the implications of such schemes on their lives, their land rights and their future.

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Conclusion

Educational efforts among the Bakun people through longhouse discussions, exposure programmes and signature campaigns raised their awareness about the impact of the project on their lives if the project went ahead.

However, there has been a lack of consistent and systematic efforts to organize the people to empower themselves towards maintaining control over their land. The people, too, are at times passive, and dependent on external sources for help. Some of the communities still fear their political leaders, and local communities are warned and 'bought' by the government. No local leader has come out of these communities to organize the people although one potential organizer has been identified.

In this context, future work in Belaga will concentrate on one community to identify potential local leaders and to help them build up their understanding and commitment. They will be the ones to organize their people for power while we play supportive role in terms of training, research and documentation.

Magat Dam: Failure of people's mobilization

SABINO G PADILLA, JR

Description

The Magat Dam, located some 350 kms northeast of Manila on the island of Luzon, Philippines, now stands as the largest single infrastructure in Southeast Asia. It is, in fact, the largest dam in Asia. It is the most prominent part of what is called the Magat River Multipurpose Project, or MRMP[1]

The MRMP was conceived on 25 October 1962, with the signing of an agreement between the Philippines government and the United States Agency for International Development (USAID). The agreement called for the establishment of a comprehensive programme of water resource management in seven major river basins in the country. Among them was the Cagayan River Basin, which includes the sub-basins of the Magat and Chico rivers.

In December 1966, the United States Bureau of Reclamation (USBR) Water Resources Survey Team, with the assistance of the Bureau of Public Works, prepared and submitted the Cagayan River Basin Report. This report concluded that the two sub-basins mentioned above appeared to have the most favourable potential for water resource development.

The Magat River Feasibility Study, which was started on 1 July 1971 and was completed on 30 June 1973, was prepared by the National Irrigation Administration (NIA)[2], with the technical assistance of the USBR, in cooperation with the USAID. Based on this report, the MRMP's construction was authorized by Presidential Decree 693, which was signed by ex-President Ferdinand Marcos, on 7 May 1975. The NIA was designated as the implementing agency. Construction proper commenced in 1976.

The project has two main components: the dam aspect and the irrigation aspect.

The irrigation aspect involved mainly the rehabilitation and extension of existing irrigation systems in the area. All in all, the MRMP service area was to be expanded to 102,000 hectares.

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[1] Information for this section came from brochures prepared either by the National Irrigation Administration or the National Media Production Center: "Dam Aspect: (MRMP)", two separate summaries with the same title; and the "(MRMP) Irrigation Aspect: A Mission for a Decade and Beyond".

[2] The NIA is involved in the twin programmes of irrigation and hydro-electric power generation.

Stage II of the irrigation was actually the dam aspect, and involved the building of a storage dam and power plant, with an installed initial capacity of 360 megawatts.

The projected total cost of the MRMP was P4.2 billion. The MRMP was jointly financed by the Philippine government and various foreign lending institutions, including the World Bank.

The irrigation aspect was financed mainly by the World Bank and the Asian Development Bank.

For the dam aspect, the World Bank extended a $ 150 million loan to finance the foreign exchange requirement. In addition $ 9 million was obtained from Bahrain for the purchase of other equipment for the diversion tunnels, soil laboratory, model testing, and communications system. The total project cost was estimated at P3.3 billion upon completion in 1983. Thus the dam cost more than 75 per cent of the total cost of the MRMP.

The Magat River

The northeastern corner of Luzon comprises the Cagayan Valley. This valley is bound on the east, south, and west by mountains. The river which gives the valley its name is the principal drainage way of the Cagayan River Basin. The Cagayan River, which has an annual run-off of 53,943 million cubic metres, traverses the entire length of the valley and flows in a northerly direction.

The Magat River is the largest of all the Cagayan River's tributaries, with an annual run-off of 9,717 million cubic metres. Its headwaters are in the southern mountain range, the Caraballo. From there, it stretches for 150 kms before joining the Cagayan River in the heart of the valley.

The site of the MRMP is the southeastern corner of Isabela, which is the central province of the valley. The terrain is hilly, as it is near the point where the Caraballo meets the western range, the Cordillera.[3]

The dam site is located in Planas, which is a barrio of the town of Ramon. Ramon can be reached by an all-weather road from Santiago, which is on the main highway traversing northeastern Luzon.

Projected benefits from the MRMP

According to NIA literature, the following were seen as the probable economic and social good that would accrue from the MRMP:

1. **Rice production**—Irrigated lands will increase to 102,000 hectares. Cropping intensity will rise to 200 per cent, paving the way for increased mechanization. Increased rice production will generate additional jobs in the transport, processing, marketing and service sectors. The project will create an additional 8.5 million man-days of farm labour annually.

2. **Electricity**—The hydro-electric power plant's initial capacity of 360 megawatts, with a provision to add two more units to ultimately increase its capacity to 540 megawatts, will be enough to supply the energy needs not only for Isabela or the Cagayan Valley, but also the whole of northern Luzon.

3. **Increased water supply** for growing population centres.

[3] The Cordillera is the site of the headwaters of the Chico River, which flows into the Cagayan River in the province north of Isabela.

4. Flood control.

5. Opportunities for waterbased recreation.

6. Tourism.

7. Fish conservation and production.

Projected problems

But the "largest dam in the making in Asia" was constructed without opposition, without even an inquiry. Not even in the years 1979 onward did the MRMP become an issue, even within the province of Isabela.

I came to Isabela in 1979 to head the Research and Documentation Desk of the Catholic Church's Social Action Center unit in that province. Two of the initial projects of that desk were to make a list of the research needs of the area, and to come up with a provincial profile after the research needs had been answered at least in part.

The desk naturally listed the MRMP as a priority research need, considering the fact that it was at the height of construction then. However, due to a number of factors which are discussed later on in the paper, the MRMP was never studied in full by any people-oriented group or institution.

Failing to rouse a widespread interest and support for a full-scale study of the MRMP, the desk endeavoured simply to look into bits and pieces of the whole thing. It managed to get the basic data regarding the dam's construction. It also managed to make an inquiry, although not too deep, into some problems caused by the project.

The desk saw that two main groups stood to suffer due to the Magat Dam. One group comprised families who had to be relocated due to the rising of the waters. The other was that of the labourers involved in the dam's construction.

Most of the materials were obtained by a desk researcher who had a distant cousin employed as a low-level supervisor in the MRMP. Direct social investigation was not possible because of the surprisingly (or perhaps not really surprisingly) tight security in the construction area.

Resettlement

The completion of the dam was to cause the inundation of 4,500 hectares of land, and 348 families were reported to be affected, according to a 1980 progress report on the resettlement.[4] But only 304 families were to be resettled and entitled to lands and houses in the resettlement areas, because 44 preferred to transfer where they had other lands.

An IBRD report, on the other hand, states that a total of some 500 families would be affected, 300 from the reservoir area and 200 from the resettlement area. No mention is made in the Reservoir and Resettlement Division progress report of those affected in the resettlement area.[5]

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[4]Cenaro U Salamanca (Chief, Resettlement and Reservoir Division, NIA-MRMP), "Status of the Resettlement Exercise" (as of February 1980). The same division had printed a very sketchy "Basic Information on Resettlement" in November 1978.

[5]IBRD Appraisal Mission, "Philippines Magat River Multipurpose Project: Stage II—Staff Appraisal Report," c. late 1977 or early 1978. The mission visited the Philippines in October-November 1977. This feasibility study was made because the Philippine government had requested the Bank's assistance in financing the second stage of the MRMP.

Three resettlement areas were chosen:

Barrio	Town	Province	No. of families
San Miguel	Ramon	Isabela	146
Villamarzo	Cordon	Isabela	110
San Jose	Potia	Ifugao	45

Cordon and Potia are towns south and east respectively of Ramon.

The report declared that the resettled families would each be given a three-hectare farm lot and a core house. "Given" was not an accurate term, for these would be paid for from the cost of their former properties. If there was any balance left, this was to be paid for in an "easy instalment plan without any interest." In case of a balance in favour of the (re)settler, this shall be paid to him in cash. In the resettlement areas, public buildings were to be provided with government funds.

The MRMP workers

As noted earlier, the Research and Documentation Desk was unable to make a deep study regarding the MRMP. Information on the plight of the MRMP workers was obtained by the researcher mentioned before. She spent a two-week "vacation" with her cousin, and through that cousin managed to get into the MRMP workers' compound for short periods of time.[6]

At the peak of construction (1979-80), there were some 10,000 workers employed. Most of them were from Luzon provinces south of Isabela. These migrant workers brought their families with them.

A number of labourers lived in company bunkhouses, but most simply built nipa huts in unofficially designated living areas. These areas had no road, sewerage, and adequate water facilities. There were, however, some artesian wells. In essence, the clusters of workers' houses looked like slum areas incongruously situated in a rural setting.

At that time, most of the workers were paid hourly rather than daily. Rates were from P 1.65 ($ 0.08) to P 3.00 ($ 0.15) depending on the type of work. Overtime was from P 2.00 to P 2.50 ($ 0.10-$ 0.12) per hour. The workers paid monthly receive a living allowance of P 300 ($ 15) a month. Medicare and social security benefits are taken away from this allowance. The living allowances of those paid daily vary according to the rate received.

To further aggravate their economic situation, since they were far away from the town centre, they had to buy basic goods within the construction site at much higher prices.

The actual length of their working day was 11 hours. They had a 15-minute rest for lunch. Absences meant no pay. In addition, the absenting labourer had to put in four hours of work without pay for every day that he did not work.

There is a clinic where service is free, but this medical facility lacks equipment and medicines.

Stories of labourers dying in work-related accidents circulate in the housing clusters. But most workers closely questioned about this area afraid to openly state what they know, making verification and therefore dissemination, impossible. There is feeling, secretly whispered, that "the machines are more important than the men" because compensation for a dead labourer is only P 5,000 ($ 250), while dam equipment may cost a minimum of P 20,000 ($ 1,000).

[6] Some of her findings were reported in "Workers in Isabela", **Courier**, May 80. **Courier** is the newsletter of the Isabela Social Action Center.

Why MRMP was ignored

A variety of reasons put together made a study of the real socio-economic benefits of the MRMP. Such a study was not feasible during the time (1979-1982) that I was at the Research and Documentation Desk of the province's Social Action Center.

One minor reason was that the desk was just being established, and a majority of its personnel was inexperienced in research and documentation. But the major reason was that the people-oriented institutions in the province did not see the MRMP as a priority research need. The economy of the province, like the rest of the Philippines, was based primarily on agriculture. Therefore, peasants were the focus of most community-based projects. If there was any attention given to the labour sector, it was to the workers employed in the logging companies that proliferated in the province.

At that time, the organizing of what are called middle forces (those who are not peasants or labourers, but who are not the elite either) had just begun. The middle forces are considered to be the potential members of support groups. The MRMP project was not considered to be a rallying point for the building up of support groups; such groups were mobilized for issues involving either the peasants or the logging company workers.

Isabela is considered to be a hotbed of insurgency. The radical leftist New People's Army had a stable foot-hold in the province. But it was concentrated in the northern and eastern part of Isabela, while the MRMP is in the southwest. There was also no attempt on the part of the NPA to do their own research and to mobilize forces for the project.

No group attempted to organize the MRMP workers. Aside from the above-mentioned conditions, this task would have had as obstacles the transient nature of their jobs and the tight security in the area. In addition, the workers had come from various regions, each with its own language.

Unanswered questions

It is now almost five years since the MRMP was completed. One wonders if the project is going the way of other such infrastructure projects, wherein in the end they never fulfil the benefits which should have been derived from them.

Has there been any unforeseen harmful ecological effects? Is the power plant generating the promised amount of electricity? In the first place, who are actually benefiting from the electricity generated?

Usually, what has happened is that the increase in production costs offsets the larger income derived from the increase in the farmers' productivity. Have the farmers in the surrounding areas increased their productivity? And if so, has this resulted in a corresponding increase in their net income?

Now we shall never know just how much the MRMP workers suffered. And even after all this time, even after I had resigned from my Isabela job, I wonder about the answers to the questions presented above.

Until now, the people-oriented groups in Isabela have yet to realize that considering the tragic effects of other dams in other places, it is imperative that the existence of the MRMP be given some attention.

Chico River Dam and Beyond: People's struggle for self-determination

GERALDINE F FIAGOY

The successful resistance of the people against the attempted construction of the Chico River Dam in the Cordillera highlands of northern Philippines is one of many events in Cordillera history, where the people asserted their right to self-determination. The repression of the people's legitimate protests put the otherwise unknown highland region onto the world map. The people's opposition to the project also generated support from human rights groups and environmentalists all over the world. Although there were other development projects which affected the Cordillera in the 'seventies, it was the Chico controversy which served as a rallying point for many Cordillera people in their struggle. The dam was opposed even by those who were not affected but who questioned the authority of the government to impose development on a people even at the cost of their extinction.

The Cordillera people

The indigenous inhabitants of the Cordillera region compose seven major and five minor ethnolinguistic groups. The major groups are the Tinggian, Ibaloy, Ifugao, Kalinga, Kankanaey, Bontok and Kalanguya. The collective name for all these groups is Igorot or people of the mountains.

Historically, the Cordillera highlands was regarded by both Spanish and American colonial governments as a resource base; hence, the repeated incursions of both colonizers into the highlands to appropriate its mineral wealth. The attitude of the Philippine government towards the indigenous people was no different. The area was still considered a resource base whose wealth had to be extracted in total disregard of the welfare of its inhabitants. Through the years the people lost their lands as a result of unjust laws, requiring them to acquire paper titles to the land. They also suffered displacement due to development projects such as dams, mines and the timber industry. At the time the government neglected to give them basic services, such as health and education. Roads were built into the highlands to service tourism, and extractive industries such as logging and mining were established.

The marginalized condition of the majority of the inhabitants is the result of years of neglect suffered under a government whose interest in the Cordillera is limited to the extraction of its resources. That the Bontok and Kalinga would resist the construction of the Chico Dam was not expected by the hydro-electric power development authorities.

The American government earlier saw the potential of the Philippines as a source of raw materials and cheap labour. Although it condescended to give "independence", it ensured that it would still wield influence in the country and made plans for further exploitation of its neo-colony.

The American government sent the Bell Mission to the Philippines to study its resources. In 1946, the National Power Corporation and Westinghouse conducted a survey on the energy sources of the country and recommended the damming of several rivers in the Cordillera.

The construction of the dams did, in no way, result in the development of the Cordillera or the affected communities. On the contrary, the dams caused dislocation and environmental destruction. The experience of the people affected by the Ambuklao-Binga Dam served to legitimatize and strengthen the Chico River people's opposition to the Chico River Dam project.

Case studies of dam projects

1. The Ambuklao-Binga Dam

After the Second World War, the need for power development became a priority item, prompting the government and Westinghouse to prepare the Philipoines Power Programme, which recommended the Agno River Basin Development Project. The original plan was the construction of six dams along the Agno River, although only two have been completed since 1956.

In the process, 350 families belonging to the Ibaloy ethnolinguistic group were displaced, while 650 hectares of irrigated farmlands were destroyed. The government paid the people a minimal amount for the land lost and did not provide a relocation area. The majority of the people went to the upper slopes of the watershed areas.

In 1960, the government decided to resettle the people in the adjoining province of Nueva Vizcaya, to clear the watershed area already occupied by other ethnolinguistic groups and migrants from other provinces.

As a result, the Ibaloy were dispossessed of their land, but it was only 26 years later that the government initiated plans to send them to the island of Plawan. Fiftysix families were brought to Narra, Plawan and were promised assistance by the Ministry of Agrarian Reform. After a few weeks, 23 families returned to the Cordillera while the rest followed later.

It appeared that the government only identified a forest land as the resettlement area. Contrary to the people's expectations, the forest was not subdivided, nor cleared. Other problems included the absence of irrigation sources, lack of food and farm tools and other basic services which the government had earlier promised.

At present, the displaced people are back in the watershed areas and are considered illegal occupants. Some are lowly paid employees in the nursery and domestic help while others continue to till the slopes.

Meanwhile, the two dams are dying. Siltation has considerably increased. This problem is compounded by inadequate rainfall. According to a 1984 NPC report, the dams can no longer produce their total capacity of 175 MW of electricity.

2. Abulog-Gened Dam

In 1978 the Abulog-Gened Dam Project was contracted to the Japanese Engineering Construction Company. Three dams were to have been constructed along the Apayao and

Gened River in lower Kalinga-Apayao. The project would have submerged 9,400 hectares of agriculture, residential and forest land and dislocate 18,000 Isneg.

While attention was focused on the Chico, work on the Abulog-Gened Dam was underway. In 1985, the construction was stopped when the New People's Army burned the field office of the National Power Corporation (NPC) in Pudtol, Kalinga-Apayao.

3. Magat Dam

This dam was finished in 1982 at the expense of 1,861 Ifugao families who were cultivating fertile land along the Magat River. The people have been given minimal amounts for their land but no resettlement areas. Meanwhile, like other dams, the Magat Dam services the town centres of Isabel province and the big landowners.

4. The Binongan Dam

In 1984, the Binongan tribe in Abra successfully opposed the planned construction of the Lacub Dam along the Binongan River. Assisting in the preparations was an allegedly American anthropological mission which studied the Binongan and Masaddit tribes to identify which was more docile and would not resist the dam. The NPC sent engineers to do soil samples and surveys and also told the residents that plans for the dam had already been made.

To the government's surprise, the supposedly docile Binongan tribe opposed the dam construction as this would inundate their agricultural lands and submerge areas where they were mining gold. In December of the same year, NPC pulled out.

The Chico River Dam

As early as 1965, the Philippine government had considered the construction of four dams along the Chico River for hydro-electric energy but postponed the project due to high construction costs. When the price of oil leaped in the 'seventies, the government retrieved the dam project.

In 1978, the project consultant, Lahmeyer International GmbH, together with the Engineering and Development Corporation of the Philippines (EDCOP), presented the Technical Pre-Feasibility Study of the Hydro-electric Development in the Chico River. This identified four dams along the Chico, two of which would be built in Mountain Province and two in Kalinga-Apayao. According to the sturdy, agricultural production in the lower Kalinga-Apayao area would benefit from the project as about 49,000 hectares of land would be irrigated. Energy generated for the Luzon grid would be 1010 MW and would service a larger area.

On the other hand, the Chico River Basin Development Project would cover a total catchment area of 14,000 square kilometres. This would necessitate the submersion of 10 Kalinga and 6 Bontok villages along the Chico. The project would displace about 100,000 Bontok and Kalinga villagers and submerge 2,000 rice terraces and 25,000 hectares of coffee and fruit plantations. At the same time the construction of the dam would result in the loss of forest resources like game, firewood, and food products.

Culturally linked to the land, the Bontok and Kalinga equate land with life. While they resisted the dam because of its adverse effects on their economic life, they also refused to be uprooted from their ancestral land which was not only the source of life but also the abode of their ancestors with whom they regularly communicate through various rituals. Harmonious interaction with ancestral and nature spirits, in the indigenous religion, would mean a friendly

environment whose bounty may be shared by man. To be permanently severed from this would spell death.

The matter of ancestral land is also crucial in the peace-pact or "bodong". This is a traditional institution which defines the relationship between two villages and also the territory over which the "pagta" or rules of the peace-pact will prevail. This agreement of peaceful co-existence will be rendered useless if the people in one or both villages are uprooted from their communities. The construction of the dam would affect a total of 180 peace-pacts forged among the different ethnolinguistic groups along the Chico River.

The people's response

The Bontok were the first to articulate their opposition to the dam. When the inhabitants along the Chico River learned about the project, they made known their opposition by sending petitions to Malacanang and explaining that 500 Bontok families would be dislocated while some 120 hectares of fertile land would be inundated. This was ignored; instead, President Ferdinand Marcos directed the NPC to start construction of Chico II and told the delegations of local officials that the government would compensate for damages brought about by the dam construction.

However, the Bontok remained vigilant against the incursions of the dam workers. When the NPC started surveying the area, the people made sure that the surveyors were escorted by armed Igorots.

Downstream, the Malinga people also expressed their opposition to the impending construction. The people in Kagaluan appealed to their local officials to make representations to the president regarding the problem. Later they met with NPC representatives, government officials and the military to voice their opposition, but the government officials insisted that the dam would be beneficial to the people.

Convinced that they could not get any support from their government officials, the people raised funds and sent their delegations to Manila. In 1974 five delegations composed of village leaders and other residents went to Malacanang, the president's office, to voice their opposition.

Realizing that the government was intent on pursuing the project, the people resorted to meta-legal processes. They repeatedly tore down the work camps of the NPC in Tomiangan. For the fourth time, about 250 Kalinga men, women and children walked 28 kilometres, carrying the NPC equipment and tents and deposited these at the military headquarters in Bulanao, Tabuk.

On 3 February 1980 a busload of Kalinga elders journeyed to the Binga Dam site in Benguet Province to dialogue with Gabriel Y Itchon, president of NPC. The elders repeated their opposition to the dam and to resettlement. On the other hand, Itchon tried to justify the dam and also said that the government had no choice but to proceed with the plans. To this the Kalingas said that they would go home and prepare for the impending confrontation.

Because of the situation, Kalinga became a fertile ground for recruitment to the rebel New People's Army. In 1975 it was reported that a cadre of the NPA entered the dam-affected areas and successfully recruited many Kalinga youth. Thus was the Chico Dam struggle linked to the nation-wide resistance against US imperialism.

Role of support groups

Interest in the Chico was generated by news about the people's opposition to the dam. Students, journalists and church groups rallied on the side of the Bontok and Kalinga. These groups documented the events and conducted research in the affected area. The data would

later be used to legitimatize and strengthen the people's opposition. Information campaigns were also conducted in the urban centres, academic institutions and also outside the country. Solidarity was expressed by the support groups who regularly monitored the affected areas.

The people's opposition to the Chico Dam was a reality which even the conservative Roman Catholic Church could not ignore, and it placed itself on the side of the people.

In 1975, the Bontok elders summoned Bishop Francisco Claver, a Bontok who was assigned to southern Philippines. After the bishop met with his people, he wrote an open letter to President Marcos questioning whether it was just to sacrifice the people along the Chico in the name of development. He also explained that the people who faced displacement were culturally linked to the land.

Other religious leaders like Bishop Emilio Mandangeng and Sister Basil and others assigned in the area held dialogues with the government to find out whether the latter had concrete plans for resettlement and compensation for the people. After being convinced that the government was not sincere in its pronouncements regarding compensation and resettlement, the religious leaders refused to help the latter campaign for the construction of the dam. Instead, they demanded that people should participate in decision-making projects affecting them.

Government response

In response to the people's opposition, the government established the Presidential Assistance for National Minorities (PANAMIN) to plan and implement socio-economic projects "to enable minority groups to cope with the problems of the modern world, while retaining their identity and human dignity." Clearly, this was a strategy to co-opt the people and prevent further opposition. While some leaders fell into this trap, the majority of the people remained vigilant and opposed, and they exposed PANAMIN's activities which included dividing the tribal people by arming one of two warring villages.

PANAMIN also resorted to bribery. In 1975, the barrio (village) officials in Pasil municipality of Kalinga were given five hundred pesos each for village projects. The officials returned the money and urged others to do the same to preserve the unity of the Kalinga. In the same manner, PANAMIN secretary Manda Elizalde also tried to buy the Kalinga by distributing money in Pasil. The elders collected the money and returned it to Malacanang.

In 1976, a group of 130 Kalinga were brought by PANAMIN to Manila allegedly to dialogue with the president. In the city the people were billeted in different hotels and then pressurized to sign a petition expressing support to the Chico Project. When they returned to Kalinga the delegates denounced the coercion and also retracted their statements.

To further co-opt the people the government created the Kalinga Special Development Region "to foster and accelerate the growth and development of the Kalingas" municipalities. Again this was used in the campaign for the dam construction.

The government also offered a relocation site for those who would be displaced. Each family was to be given two hectares of irrigated land and a house. A 23-house relocation site was built in lower Kalinga It turned out later that the few families who were willing to be relocated were not allowed in this model relocation site. Instead, they had to build their huts outside this area while the soldiers occupied the concrete cottages in the compound.

Evolution of the peace-pact

The indigenous political institution which defines the relationship of the Chico River villages is the "bodong" or peace-pact. Traditionally, the "bodong" is an agreement of peaceful

co-existence between two villages. In the rules or "pagta" agreed upon, the territorial boundaries which the peace-pact covers are also defined. Problems covered by the "bodong" include violations regarding territorial boundaries, murder, theft and others specified in the "pagta". At the height of the Chico controversy the "bodong" evolved from a bilateral to a multilateral pact as adaptation to the changing conditions. The dam and militarization were the major issues discussed in the new "bodong".

The Kalinga elder, Macli-ing Dulag, organized the first "bodong" against the dam. This was held in Tanglag in 1975. After a few months, elders from Bontok and Kalinga travelled to Manila to participate in a Vochong (Peace-pact) Conference. Here, supporters from the urban centres composed of students, clergy and advocates for indigenous people's rights expressed support.

In June 1978 representatives of 21 Kalinga and Bontok villages gathered in Bugnay, Tinglayan, Kalinga-Apayao for another multilateral "bodong". Together with supporters from sectoral anzations, including the clergy, the people resolved to consolidate their forces as the problems posed by the Chico project could be better confronted by a bigger group.

Bugnay was again the venue of a bigger "bodong" held in December of 1979. At that event problems like militarization and collaboration were discussed. The people agreed to exclude from the protection of the "bodong" villagers who supported the dam and even became employed in government agencies directly involved in the dam construction.

In October 1980 the people met in Tanglag barrio in Kalinga to renew their ties and to assess the situation in the valley. They again reiterated their opposition to anyone who was for the dam.

Militarization in the Chico Valley

Failing to influence the majority of the people through PANAMIN and the corrupt KSDR, the government resorted to harsher methods by harassing the villagers and arresting the oppositionists. In 1976, 41 Bontok and Kalinga leaders were arrested for subversion. This strategy of detention in relation to the dam would continue for years. In 1977, people who prevented the NPC workers from surveying the waterline were arrested and maltreated by the soldiers. By April 1977 about 150 people were in detention, 50 of whom were transferred to Camp Olivas, a military camp in lowland Pampanga Province.

The absence of the men from the villages finally provided the NPC the opportunity to build its station in Tominangan. Meanwhile the fields became untended as women were left to care for home and farm. At the same time they avoided going to the fields for fear of being molested by the soldiers. In some villages, conditions deteriorated, prompting support groups to send food to the area.

In 1978, PANAMIN, having been discredited, withdrew from Kalinga. The 60th Infantry Battalion which took over, committed a string of human rights violations, resulting in the Kalingas presenting a signed petition demanding their withdrawal. At the same time the NPA attacked the NPC camp in Tominangan resulting in the death of four employees. This prompted the government to declare the area as no-man's land. This area covered some 785,400 square metres and included ricefields, orchards and pasture lands.

At the end of the year the 51st Infantry Battalion arrived from battle-torn Mindanao island in the south and replaced the 60th IB.

The militarization of Kalinga and adjacent areas in the mountain province led to further suffering by the people who were accused as subversives and rebel sympathizers. Cases of human rights violations in the late seventies mounted as torture, rape and executions were committed by the military on the civilian population. The people's material culture was also

decimated as the marauding soldiers stole precious heirloom pieces such as gongs, porcelain ware and beads. Military checkpoints were established along the Bontok-Kalinga road to check on the travellers. The villagers were required to secure clearances in order to travel to other villages.

The murder of Macli-ing Dulag

Macli-ing Dulag was a Kalinga from Bugnay, one of the villages affected by the Chico project. Employed as foreman by the Department of Public Highways, Dulag was also a village elder who led his people in opposing the dam construction. Because of his influence and staunch opposition, the government tried several times to buy him over. On the night of 24 April 1980 he was killed inside his house. His assailants were elements of the 44th Infantry Batallion led by Second Lieutenant Leodegario Adalem, a notorious officer known for his brutal treatment of the Kalinga people.

International outrage over Dulag's murder

Adalem could have escaped prosecution had not the Kalinga and Bontok people, together with concerned lawyers and other supporters been vigilant in pursuing the case. In July 1980 over 2,000 villagers met and resolved not to wait for the "reactionary government to give justice and due process to Macli-ing's death". This was followed by a letter to President Marcos denouncing the murder and signed in blood by 28 representatives of the Kalinga villages.

Other Filipinos also expressed outrage over the incident. Fact-finding teams were organized to investigate not only the Chico Dam project but also Macli-ing's death. Progressive government officials like senators Lorenzo Tanada and the late Jose Diokno travelled to the highlands to express their solidarity with the people.

Disgust over Macli-ing Dulag's death reverberated around the world. His murder was denounced not only by the Filipino people but also by international support groups and human rights advocates. The publicity generated was so embarrassing to the government that the latter was forced to shelve the Chico Dam project in 1981.

The people were also vigilant in seeking justice for the death of Dulag. Members of the media who understood the Igonoţ people's struggle regularly wrote about the Chico controversy and the brutal murder. Progressive lawyers and clergy, together with the Cordillera people, pursued the case relentlessly. Finally in 1984, Second Lieutenant Leodegario Adalem was convicted for the murder of the Kalinga hero. To many Cordillera people and supporters, the officer's conviction was a victory but not the end of the struggle.

The struggle for self-determination continues

The people's assertion of their rights resulted in the stopping of the dam construction. The experience, however, led the Cordillera people to further consolidate to avoid another Chico Dam. The end of the Chico project did not lead to the collapse of the multilateral peace-pacts which earlier proved effective in confronting the dam problem. New forms of people's organizations grew from the Chico experience.

In 1981 elders and representatives from various villages in Mountain Province and Kalinga met in Betwagan, Sadanga, Mountain Province to share their experiences and problems. The people discusssed the problem of militarization and agreed to exempt from the peace-pact villagers who joined the military or who became informers.

From 1982 to 1983 the people of the Cordillera and support groups met to renew their ties and to honour the slain Kalinga hero on his death anniversary. The first memorial meeting was held in Dulag's home in Bugnay. The following year the memorial meeting which was to have been held in the adjacent village of Bangad was aborted when the military harassed the participants.

The Kalinga-Bontok Peace-pact Holders Association

In 1984, the villagers decided to form the Kalinga-Bontok Peace-pact Holders Association. The objectives of this group were to strengthen their unity and to respond to problems like militarization and the restoration of broken peace-pacts. The organization changed its name to Cordillera Bodong Association to include peace-pact holders in villages outside the Bontok and Kalinga areas.

The CBA has been instrumental in resolving inter-village problems. In 1986, the organization included socio-economic development as part of its programme. With some solicited funds and technical advice, several villages formed cooperatives and constructed irrigation and waterworks systems.

The Cordillera People's Alliance

On June 1984, at a congress held in Bontok by representatives of 27 community and sectoral organizations, the participants discussed problems faced by the indigenous people of the Cordillera. The problems brought about by the Chico Dam Project and how the people confronted these, were recalled. All these led to the conclusion that the Cordillera people must continue to assert their right to self-determination in order to survive. The result of the congress was the formation of a broad-based alliance of people's organization, including the Cordillera Bodong Association, which would work for the realization of a programme for self-determination. This would include the people's right to ancestral domain, the right to manage and control the resources within, the right to economic prosperity and cultural integrity and the right to self-government.

Today the CPA has grown to 130 organizations with a membership of about 40,000. In 1986 it successfully campaigned for the provision of a Cordillera autonomous government in the 1986 Constitutional Commission.

Although the Cordillera people faced other problems in the 1970s, it was the Chico Dam experience that provided the impetus for the people's struggle for self-determination. It was also the Chico Dam experience which generated questions about the right of the government to impose development on a people. The lessons learned in the Chico struggle have indeed been useful in the formulation of a programme for self-determination which the CPA, the biggest organization in the Cordillera, is advocating.

Workshop on People and Dams

14-18 September 1987

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ABOUT US

The Society for Participatory Research in Asia (PRIA), New Delhi is a non-profit voluntary organization registered under the Indian Society's Act.

Participatory Research is a methodology based on the belief that knowledge is power and therefore contributes towards the empowerment of the oppressed and the poor. It promotes the involvement of the poor and their organizations and representatives in the creation and utilization of knowledge in their own collective interests. Thus, it attempts to challenge the monopoly over knowledge and its tools in the hands of the few.

PRIA works with local groups and activists involved in the education and organization-building efforts and struggles of the marginalized and underprivileged sections of society.

We provide support through research, training, evaluation, networking with groups on common issues and preparation and dissemination of learning materials.

We are a team of 20 people working with several partner groups all over India.

In the last 7 years of its existence, PRIA has specially focused on primary health care and adult non-formal education, problems of deforestation, land alienation and large dams, women and work, women and sanitation, occupational health hazards and management issues of NGOs.

PRIA is constantly involved in efforts to promote the understanding and practice of PT philosophy and methodology by holding workshops and documenting several efforts in the country.

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